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SESOIL Execution Using the Data Management Supporting Systems SESIN and SESOILFM. User's Guide

General Software Corp., Landover, MD

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I. Introduction

SESOIL is a Seasonal SOIL compartment model developed by Bonazountas and Wagner (1981) for the Office of Pesticides and Toxic Substances (OPTS) of the Environmental Protection Agency (EPA). It estimates the rate of chemical transport/transformation from the soil surface to groundwater (i.e., the unsaturated zone) in terms of mass and concentration distributions among the soil, water (i.e., the unsaturated zone) and air phases. As it was originally designed, SESOIL is batch oriented and, as such, does not support direct user interaction. The preparation and update of input data files can be manually made through the conventional text editor. The output results are in report form containing numerous parameters presented in a fixed-format fashion.

Under the auspices of the modeling team in the Exposure Evaluation Division (EED) of OPTS, the General Software Corporation (GSC) has implemented two data management systems, one for the input and one for the output, in support of the SESOIL modeling operation. The input data management system (SESIN) uses interactive prompts to assist you, the user, in the preparation of the model input files. A set of SESIN commands have been designed to perform efficient file manipulation and data editing. The output data management system (SESOILFM) provides for analyses of SESOIL output parameters, using available facilities for graphical, statistical, and tabular displays.

Additionally, a data base is available through SESIN to provide a majority of input data required by SESOIL for a total of seventy (70) cities in the United States. SESOILFM can also be used to generate an input data file for AT123D (Yeh. 1981), a transport model for the saturated zone, so that SESOIL and AT123D may be coupled to serve as a complete modeling tool for the subsurface pollutant fate analysis.

The purpose of this document is to describe in detail the procedures required to execute SESOIL through the use of the two data management systems. It is intended as a comprehensive guide for users who have no specialized computer knowledge. However, a working knowledge of the Graphical Exposure Modeling System (GEMS) (GSC 1982), through which SESOIL is executed, is necessary for making more efficient use of the SESOIL model. Only a brief description of SESOIL's input data file structure is presented to facilitate subsequent discussions. More detailed model information is contained in the original SESOIL manual (Bonazountas and Wagner 1981).

II. SESOIL DATA STRUCTURE

A. Input

Three input data files are required by SESOIL: GENERAL, LEVEL, and EXEC. Since the EXEC data file originally required by SESOIL is generated automatically by SESIN, only the GENERAL and LEVEL data files are discussed.

On the basis of the analysis need and the degree of accuracy expected in the modeling results, SESOIL allows you to select among four (4) different types (i.e., LEVEL0, LEVEL1, LEVEL2, AND LEVEL3) of LEVEL data file, each type representing a different level of data requirement sophistication. In general, the LEVEL0 and LEVEL1 data files are for analyses on an annual basis (one year only) of a 2-layer soil column. The LEVEL2 data file is for analyses on a monthly basis (from 1 through 10 years) of a 2-layer soil column. The LEVEL3 data file is similar to the LEVEL2 data file with the exception that the soil column is sliced into a 3-layer configuration. A detailed presentation of these data files is given below.

1. GENERAL DATA FILE

This data file contains the following climatologic, soil, and chemical input parameters:

-- Climatologic

L	Latitude of area (degree N)
TA	Temperature of area (degree C)
NN	Fraction of area covered by clouds (fraction)
S	Relative humidity of area (fraction)
A	Shortwave albedo of surface (-)
REP	Daily evaportranspiration (cm/day)
MPA	Annual precipitation (cm)
MPM	Monthly precipitation (cm)
MTR	Mean time of rain (days)
MN	Mean number of storm events (#)
MT	Mean length of rainy season (days)

(Note: All parameters are presented either yearly or monthly, depending on the selected type of the LEVEL data file. MPA is used for LEVEL0 and LEVEL1 only)

-- Soil

RS	Soil density (g/cm^3)
K1	Soil intrinsic permeability (cm^2)
C	Soil disconnectedness index (-)
N	Effective soil porosity (-)
OC	Organic content of soil (% OC)
CC	Clay content of soil (% CC)
CEC	Soil cation exchange capacity (me/100g)
K1U	Intrinsic permeability of upper soil layer (cm^2)

K1M	Intrinsic permeability of middle soil layer (cm^2)
K1L	Intrinsic permeability of lower soil layer (cm^2)

(Note: All the above parameters are not necessarily needed for a given type of LEVEL data file.)

-- Chemical

SL	Compound solubility in water (ug/ml)
KOC	Adsorption coeff in organic carbon (ug/goc)/(ug/ml)
DA	Diffusion coeff in air (cm^2/sec)
KDE	Biodegradation rate of compound (day^{-1})
H	Henry's law constant (m^3*atm/degK*mol)
K	Adsorption coeff in soil (ug/g)/(ug/m)
MWT	Molecular weight (g/mol)
VAL	Valence
KNH	Neutral hydrolysis constant (day^{-1})
KBH	Base hydrolysis constant (L/mol*day)
KAH	Acid hydrolysis constant (L/mol*day)
SK	Stability constant compound-lig and complex(-)
B	Moles of lig and per mole of compound complexed [#]
MWTLIG	Molecular weight of lig and (g/mol)

2. <u>LEVELO Data File</u>

This data file contains the following input parameters:

AR	Surface area of the compartment (cm^2)
Z	Depth to groundwater table (m)
DU	Depth of upper soil zone (cm)
PH	pH of upper soil zone (-)
APH	Ratio: pH lower to upper soil zone (-)
AKDE	Ratio: biodegradation rate lower to upper soil zone (-)
AOC	Ratio: Organic carbon lower to upper soil zone (-)
ACC	Ratio: Clay content lower to upper soil zone (-)
ISRA	Index of surface runoff participation in pollutant transport (-)
ASL	Ratio: Pollutant conc. in rain to maximum solubility in water (-)
ACEC	Ratio: CEC lower to upper soil zone (-)
POLINU	Total pollutant load per year entering upper soil zone (ug/cm^2)

POLINL	Total pollutant load per year entering lower soil zone (ug/cm^2)
LIGU	Lig and input mass to upper soil zone (ug/cm^2)
LIGL	Lig and input mass to lower soil zone (ug/cm^2)
THA	Soil moisture content (%)
IA	Infiltration (cm)
RGA	Groundwater recharge (cm)
RSA	Surface runoff (cm)

3. LEVEL1 Data File

This data file contains all the input parameters listed for the LEVEL0 data file except THA, IA, RGA, and RSA.

4. LEVEL2 Data File

This data file contains the following input parameters:

AR	Surface area of the compartment (cm^2)
Z	Depth to groundwater table (m)
DU	Depth of upper soil zone (cm)
PH	pH of upper soil zone (-)
APH	Ratio: pH lower to upper soil zone (-)
AKDE	Ratio: biodegradation rate lower to upper soil zone (-)
AOC	Ratio: Organic carbon lower to upper soil zone (-)
ACC	Ratio: Clay content lower to upper soil zone (-)
FRN	Freundlich equation exponent (-)
ACEC	Ratio: CEC lower to upper soil zone (-)
CUM	Conc. pollutant in soil moisture upper zone (g/ml)
CLM	Conc. pollutant in soil moisture lower zone (g/ml)
POLINU	Pollutant load per unit area entering upper zone (ug/cm^2)
POLINL	Pollutant load per unit area entering lower zone (ug/cm^2)
ISRM	Monthly index for pollutant appearance in surface runoff (-)
ASL	Monthly ratio: conc. of pollutant to maximum solubility in H_2O (-)
TRANSU	Pollutant transformed in upper zone (ug/cm^2)
TRANSL	Pollutant transformed in lower zone (ug/cm^2)
SINKU	Pollutant lost by processes not described (upper) (ug/cm^2)

SINSL	Pollutant lost by processes not described (lower) (ug/cm^2)
LIGU	Lig and mass input to upper zone (ug/cm^2)
LIGL	Lig and mass input to lower zone (ug/cm^2)

(Note: Parameters CUM through LIGL are expressed in terms of monthly values)

5. LEVEL3 Data File

This data file is, in structure, almost identical to LEVEL2 data file with the exception of additional entries for the third (middle) soil layer.

Examples of the GENERAL, LEVEL0, LEVEL1, LEVEL2, and LEVEL3 data files are given in Appendix 3. Note that:

- The GENERAL data file contains data for different sites, soil types, and chemical compounds.
- For simulation period of more than one year (LEVEL2 or LEVEL3 application), the input parameters can be repeated for each additional year under consideration for up to 10 years.
- For simulation of many years of data (up to 100 years) for a desired scenario of pollutant loadings, an auxiliary file (AUX) can be created which contains the variables POLINU, POLINL (LEVEL2) and POLINM (LEVEL3). The user is prompted to build this file only if the number of years of available data in the GENERAL and LEVEL files are less than the desired number of years to be simulated as given by the parameter JYRS in the EXEC data file.
- LEVEL0, LEVEL1, and LEVEL2 data files also contain data for more than one site location.

B. Output

Output results of SESOIL include hydrologic balance calculations and the distribution of pollutant in the soil column. After successfully following the procedures described in this document, you are able to obtain a complete hard-copy SESOIL output for review. A total of 86 selected SESOIL output parameters can be stored in GEMS for further analysis.

III. CONCEPT OF DEFAULT FILES

To minimize the complications involved in the preparation of SESOIL input data files, the design of SESIN is based on the central concept of providing you with a complete set of default files with which you can perform all necessary file editing and manipulations. In requesting the default files, there are three options supported by SESIN:

1. The default files are retrieved from the 70-city data base (Note: This data base only provides data for Level 3 operation).

2. The default files are retrieved from the files presented in Appendix 3.

3. The default files are specified by you.

The use of Option 1 is illustrated in Appendix 1. Note that once these default files are available to you, you must review all the default values carefully to check their applicability to your simulation run. In some cases, some default values are provided for you only to ensure the completeness of the file content and they must be revised by you in order to give meaningful simulation results.

IV. GUIDE TO SESOIL EXECUTION AND DATA MANAGEMENT

A. Access to SESOIL

You can access SESOIL through the Graphical Exposure Modeling System (GEMS). The host computer of GEMS is Digital Equipment Corporation VAX-11/780, located at EPA's National Computer Center (NCC) in Research Triangle Park, North Carolina.

It is assumed that you are familiar with the log-on procedures of the VAX system and are able to invoke GEMS (Consult User's Guide to GEMS, if not). After you make connection, the two steps required to gain access to SESOIL in GEMS are:

ENTER AN OPERATION: M <CR>

ENTER MODEL NAME: SESOIL <CR>

* (Where <CR> stands for pressing the carriage return key on the terminal).

B. Major Decision Points in SESOIL Execution

At the outset, and through the process of SESOIL execution, you are confronted with the following major decision points:

(1) Do I have all the GENERAL, LEVEL (LEVEL0, LEVEL1, LEVEL2, or LEVEL3), EXEC, and AUX (if necessary) data files ready for execution , so that I do not need to create those data files through SESIN? (Note: (a) The EXEC data file is required if SESIN is not used. Refer to the original SESOIL manual for description. (b) The AUX file is required if JYRS in the EXEC data file is greater than the number of years of data available in the LEVEL and GENERAL data files.)

(2) If I use SESIN support, which of the three options (see Section III) do I choose to get my default GENERAL and LEVEL data files?

(3) Do I want to generate additional years of pollutant loading data?

(4) Do I want to make multiple SESOIL runs?

(5) Do I want the support of the output data management system, SESOILFM, so that after the SESOIL execution is completed, I can perform graphical, statistical, and tabular output manipulations using GEMS' facilities?

(6) If the answer to (5) is "yes", what is the dataset name (1 to 12 characters) under which I want my SESOIL output to be stored in GEMS?

(7) Do I want to request an AT123D input file based on the SESOIL simulation results?

(8) If the answer to (7) is "yes", do I want to make an AT123D run using the AT123D input file just created?

A flowchart outlining the relative sequence of the above decision points is presented in Figure 1. As shown, the entire process can be divided into five execution branches which will be discussed below.

C. Detailed Guide to SESOIL Execution

To facilitate the following discussion, this section will be presented in terms of the five execution branches shown in Figure 1.

1. Branch 1

This is the core of the GSC-developed SESOIL data management system. The execution will enter this branch if you choose to create new data files (i.e. GENERAL and LEVEL data files) through SESIN. The main idea is to guide you interactively through an efficient data editing and file preparation process. To do this, SESIN is equipped with the following user commands:

ALL	BRIEF	<CR>	DONE	EXIT	HELP
LA120	LAST	MENU	NEXT	NOBRIEF	NONE
REST	REVIEW	REVISE	VT100		

A detailed list of command descriptions is presented in Table 1. citier

To start with, you need to select one of the three options for getting you default data files (see Section III). After the selection, you are guided by self-explanatory prompts provided by SESIN. You can respond with brief answers or use the above listed commands to control the progress of the process. The use of SESIN and its commands can be illustrated best by Appendix 1, which contains a step-by-step example side-marked with comments. You are advised to follow this example carefully in order to make efficient use of SESIN. It is to be stressed that Appendix 1 only

presents an entry-level demonstration of the use of SESIN. After becoming more familiar with the organization of SESOIL input files and the concepts of SESIN, you are encouraged to explore the other powerful SESIN capabilities through hands-on trail practices.

1.a. Branch 1-A

This branch is a sub branch of Branch 1. It represents the use of generating long-term pollutant application scenarios. The execution will enter this branch if the value of JYRS (desired number of years to be simulated) in the EXEC data file (as specified by the user) is greater than the number of years of data available in the GENERAL and LEVEL data files. If this is true, the user is prompted to specify the additional pollutant loading data (POLINU, POLINM, POLINL) for the additional years required, which is then stored in the auxiliary data file AUX. The remaining parameter values of the GENERAL and LEVEL data files for the additional years are automatically generated by repeated use of the last year of data. An example run using this Branch is given in Appendix 2.

2. BRANCH 2

This branch represents the original SESOIL data file input fashion in that it prompts you to input directly the three data files: GENERAL, LEVEL (i.e., LEVEL0, LEVEL1, LEVEL2, or LEVEL3), and EXEC. The auxiliary pollutant loading data file, AUX is also prompted for. Note that the user-prepared EXEC data file is needed in this branch. The SESOIL execution will enter this branch if you select not to create new data files through SESIN. An example is given in Appendix 3 to illustrate the use of this branch.

3. BRANCH 3

This branch represents the use of the GSC-developed SESOIL output data management system (SESOILFM), which allows you to create a dataset containing 86 selected SESOIL output variables, as shown in Table 2. This dataset will be stored in GEMS so that you can utilize GEMS' capabilities for output data manipulation, analysis, and interpretation. The columns of VAR NAME and VAR UNIT in Table 2 give brief variable definitions and variable units, respectively, to assist you in recognizing the variables to be selected for further review. Note that Variables 5 through 7, representing chemical half-life periods for different soil layers are not direct SESOIL output variables. Instead, they are derived from the degradation rates (Variables 2 through 4) of chemicals assuming a first order decay. Furthermore, Variables 73 through 86, each representing a possible transformation/transport process in the pollutant fate analysis, are calculated from the SESOIL output to show the total mass balance distribution in the unstaurated soil zone at the end of each year being simulated. Each of the variables in Table 2 is stored in the dataset on a monthly basis (i.e., not monthly applicable, such as PRECIP, MASGRW, etc.), their estimated values are stored in the dataset at the 12th month of each year. Spaces prior to the 12th month are flagged as "NO VALUE".

In addition to the variables shown in Table 2, the following identification and time-factor variables are included in the dataset to facilitate the use of GEMS' capabilities.

RUN:	Run identification number
COMP ID:	Compound name studied
LEVEL:	Modeling level selected
YEAR:	Year simulated
MONTH:	Cumulative month through the years simulated
MINDEX:	Month of given year (non-cumulative)
VAR ID:	Variable identification code (to be used to call out the variable needed)
VAR NAME:	More descriptive variable definition
VAR UNIT:	Unit for each variable

As shown, each of these variables serves a specific identification purpose. You can also use the variable RUN to retrieve (via GEMS EXTRACT and/or FILTER function) the variables for a particular run from a dataset containing multiple run records. The variable MONTH provides an across-the-years monthly time index, which you can use to observe the continuous variation of a given variable throughout the years being analyzed.

There are only three steps required to use SESOILFM for creating a SESOIL output dataset in GEMS, as exemplified near the end of Appendix 1. The steps are:

(i) enter Y in response to the prompt: "Enter Y to output SESOIL results to GEMS>"

(ii) give a dataset name (1 to 12 characters) in response to the prompt: "Enter GEMS output dataset name>"

(iii) enter a dataset description (1 to 60 characters) in response to the prompt: "Enter tag field>."

Any characters other than Y entered in Step (i) cause the execution to skip the the SESOILFM supporting service. The tag field is optional and you use it only for the purpose of more descriptive dataset identification. You can skip this entry by pressing <CR>.

It is beyond the scope of this document to describe the applications of GEMS' graphical, statistical, and tabular facilities to the SESOIL dataset described above. You are advised to consult the User's Guide to GEMS (GSC 1982) for detailed information. However, to demonstrate what kind of products you may obtain from the use of SESOILFM and GEMS file management facilities, the following examples are presented:

Figure 2: This is a display of the predicted monthly pollutant mass transport into the groundwater (INMOGRW) vs. the cummulative month index (MONTH) for a period of four years. The two curves, presenting a vivid visual comparison, are derived from two separate SESOIL runs, one with a biodegradation rate (KDE) of 1.0 day $^{-2}$ and the other of 0.22 day $^{-2}$.

Figure 3: This is a bar chart showing the cumulative effect of the curve with a KDE of 1.0 day $^{-2}$ in Figure 2.

Table 3: This is a GEMS' tabular output presenting the four variables: MONTH, MINDEX, CONWMOU, MASWMOU. Note that Table 2 is also produced using SESOILFM and GEMS.

4. BRANCH 4

This branch is activated if you elect to bypass SESOILFM by entering any characters other than Y in response to the prompt: "Enter Y to output SESOIL results to GEMS>". An example of this is shown near the end of Appendix 1.

5. BRANCH 5

This branch allows you to review the SESOIL results that are applicable to the construction of an AT123D input file. After review, if you are satisfied with the results, you can request the build up of an AT123D input file. Due to the complexity of the file content, the following assumptions are used:

- The pollutant source area is assumed to be a square with a size equivalent to the soil column area used in SESOIL.
- The aquifer depth and width are assumed to be infinite.
- The hydraulic gradient is assumed to be 0.01.
- The hydraulic conductivity is based on SESOIL's intrinsic permeability.
- The longitudinal, transverse, and vertical dispersivities are assigned on the basis of Yeh's (1981) typical values and the calculated hydraulic conductivity.
- The time interval size is assumed to be 8760 hours (i.e., one year for level 2 and 3; 730 hours (i.e., one month) for level 0 and 1.

- The loading source release is assumed to be constant (NSOUS=0) for level 0 and 1; time-dependent (NSOUS=0) for level 2 and 3.

- The loading source release is assumed to be instantaneous (INSTAN=0) for level 0 and 1; continuous (INSTAN=1) for level 2 and 3.

- The time duration of waste release is assumed to continue through the entire SESOIL simulation period for level 2 and 3; not used for level 0 and 1.

- The variable source release rate, calculated by SESOIL, is used for level 2 and 3.

- The decay constant is set equivalent to the neutral hydrolysis rate used in SESOIL.

- The distribution coefficient is taken as equal to the adsorption coefficient used in SESOIL.

Several of the assumptions which may require special attention are printed as "Notes" in the Branch-5 output as shown in the sample run in Appendix 1.

In addition to the above assumptions, the AT123D input file is also developed using various assumed program functional and execution control values. You must carefully review the file content to ensure the applicability of all input values to your specific need. You can edit or execute this AT123D input file using the AT123D data management systems, AT123DIN and AT123DOUT, by responding to the last prompt in Appendix 1 with a "yes". For more information concerning the use of AT123D data management systems, consult the AT123D User's Guide (GSC, 1983).

V. SUMMARY

A concise guide to SESOIL execution using GSC-developed input (SESIN) and output (SESOILFM) data management systems is presented in this document. The basic SESOIL data structure is discussed briefly to provide the necessary background for the efficient use of SESIN and SESOILFM. The execution logic is outlined by five major branches, each of which may be invoked or bypassed by you using interactive commands. Most importantly, detailed examples (Appendix 1 and Appendix 2) with step-by-step explanatory comments are provided to guide the user through a successful test SESOIL execution. The user is advised to follow those examples closely to ensure the most efficient use of the systems.

Again, it is to be stressed that Appendices 1, 2 and 3 present only an entry-level demonstration of the use of SESIN and SESOILFM, respectively. The more advanced capabilities of these two systems can be learned via hands-on trial practices. For assistance, call GSC at (301) 459-9494.

VI. ACKNOWLEDGEMENTS

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VII. REFERENCES

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TABLE 1. SESIN COMMAND SUMMARY

The following is a list of commands that apply within SESIN. Note that all commands do not work at all prompts.

ALL	BRIEF	<CR>	DONE	EXIT	HELP	LA120
LAST	MENU	NEXT	NOBRIEF	NONE	REST	REVIEW
REVISE	VT100					

for additional help with a command type: HELP <COMMAND>
for a full list of commands with explainations type: HELP *

ALL - for parameter input ALL designates that all parameters will be changed.
- in response to a request for a list of months ALL designates that values for all 12 months will be set to a single input value.

BRIEF - no parameter descriptions will be given when a parameter menu is displayed.

- a carriage return assumes the currently selected data.

DONE - previous input and existing values are accepted and program execution continues with the next prompt.

EXIT - the program run is immediately ended if no runs have yet been fully set up. If at least one run has been set up you will go through the exit procedure which will create your run files. If you type exit again at this point the program run will be immediately stoped.

HELP - provides command summary and descriptions.

LA120 - informs the program that the user is on an LA120 or other hardcopy terminal. Program output is slightly modified for this terminal type. This is the default terminal type.

LAST - this command can be used to modify climatic or level data for the year preceeding the current year. This is particularly useful when using the revise command to modify data from a prior run.

TABLE 1. SESIN COMMAND SUMMARY(CONTINUED)

MENU	- displays the current parameter list when at a data item prompt.
NEXT	- this command is the complement to the LAST command and can be used to move forward a year in a climatic or level data set.
NOBRIEF	- allows display of parameter descriptions to be restored after BRIEF has been used.
NONE	- at site,chemical,or soil selection this command allows the zeroing of the input data array for entry of an entirely new set of data. - at all other prompts NONE is identical to DONE
REST	- allows the user to copy the remainder of the default input data file to the sesoil input file being developed. This command only works at the enter data item to be updated prompt for monthly level or climatic data.
REVIEW	- allows the user to review the current data set. The user is prompted to enter C or A for review to review either data for just the current year or for all years up to the current year.
REVISE	- allows modification of the currently selected data (level, climatic, soil or chemical). This command is used when making multiple runs which require modification of data selected in the previous run. - NOTE when this command is used when in level 2 or 3 (monthly data) you will be left at the last data year entered when altering monthly parameters.
VT100	- this command turns off the LA120 command and can be used for all CRT terminals.

TABLE 2. SESOILFM VARIABLES SUMMARY

#	VAR ID	VAR NAME	VAR UNIT
1	DEPTHGRW	DEPTH TO GRW	METER
2	DEGRDU	DEGRAD. RATE(U)	PER DAY
3	DEGRDM	DEGRAD. RATE(M)	PER DAY
4	DEGRDL	DEGRAD. RATE(L)	PER DAY
5	HALFU	HALF-LIFE(U)	MONTH
6	HALFM	HALF-LIFE(M)	MONTH
7	HALFL	HALF-LIFE(L)	MONTH
8	ADSOIL	ADSORP CO(SOIL)	(UG/G)/(UG/ML)
9	ADOC	ADSORP CO(O.C.)	(UG/GOC)/(UG/ML
10	%OCU	% ORG. CARB.(U)	%
11	%OCM	% ORG. CARB.(M)	%
12	%OCL	% ORG. CARB.(L)	%
13	HENRY	HENRY CONSTANT	CU M-ATM/MOLE
14	DENSITY	SOIL DENSITY	G/CU M
15	PERMALL	INTRA PERM(AVE)	SQ CM
16	PERMU	INTRA PERM(U)	SQ CM
17	PERMM	INTRA PERM(M)	SQ CM
18	PERML	INTRA PERM(L)	SQ CM
19	POROSITY	SOIL POROSITY	---
20	PRECIP	YEARLY PRECIP.	CM
21	INYRU	POL YR INPUT(U)	UG
22	INMOU	POL MO INPUT(U)	UG/SQ CM
23	INYRM	POL YR INPUT(M)	UG
24	INMOM	POL MO INPUT(M)	UG/SQ CM
25	INYRL	POL YR INPUT(L)	UG
26	INMOL	POL MO INPUT(L)	UG/SQ CM
27	MOIST	SOIL MOISTURE	%
28	GRWFLOW	GRW RUNOFF	CM
29	DEGRYRU	YR DEGRADED(U)	UG
30	DEGRMOU	MO DEGRADED(U)	UG
31	DEGRYRM	YR DEGRADED(M)	UG
32	DEGRMOM	MO DEGRADED(M)	UG
33	DEGRYRL	YR DEGRADED(L)	UG
34	DEGRMOL	MO DEGRADED(L)	UG
35	INYRGRW	YR INTO GRW	UG
36	INMOGRW	MO INTO GRW	UG
37	CONWYRU	YR CONC-MOIS(U)	UG/ML
38	CONWYRM	YR CONC-MOIS(M)	UG/ML
39	CONWYRL	YR CONC-MOIS(L)	UG/ML
40	CONWMOU	MO CONC-MOIS(U)	UG/ML
41	CONWMOM	MO CONC-MOIS(M)	UG/ML
42	CONWMOL	MO CONC-MOIS(L)	UG/ML
43	CONSYRU	YR CONC-SOIL(U)	UG/G
44	CONSYRM	YR CONC-SOIL(M)	UG/G
45	CONSYRL	YR CON-SOIL(L)	UG/G
46	CONSMOU	MO CONC-SOIL(U)	UG/G
47	CONSMOM	MO CONC-SOIL(M)	UG/G
48	CONSMOL	MO CONC-SOIL(L)	UG/G
49	MASWYRU	YR MASS-MOIS(U)	UG
50	MASWYRM	YR MASS-MOIS(M)	UG
51	MASWYRL	YR MASS-MOIS(L)	UG
52	MASWMOU	MO MASS-MOIS(U)	UG
53	MASWMOM	MO MASS-MOIS(M)	UG
54	MASWMOL	MO MASS-MOIS(L)	UG
55	MASSYRU	YR MASS-SOIL(U)	UG
56	MASSYRM	YR MASS-SOIL(M)	UG
57	MASSYRL	YR MASS-SOIL(L)	UG
58	MASSMOU	MO MASS-SOIL(U)	UG
59	MASSMOM	MO MASS-SOIL(M)	UG
60	MASSMOL	MO MASS-SOIL(L)	UG
61	CONAYRU	YR CONC-AIR(U)	UG/ML
62	CONAYRM	YR CONC-AIR(M)	UG/ML
63	CONAYRL	YR CONC-AIR(L)	UG/ML
64	CONAMOU	MO CONC-AIR(U)	UG/ML
65	CONAMOM	MO CONC-AIR(M)	UG/ML
66	CONAMOL	MO CONC-AIR(L)	UG/ML
67	MASAYRU	YR MASS-AIR(U)	UG
68	MASAYRM	YR MASS-AIR(M)	UG
69	MASAYRL	YR MASS-AIR(L)	UG
70	MASAMOU	MO MASS-AIR(U)	UG
71	MASAMOM	MO MASS-AIR(M)	UG
72	MASAMOL	MO MASS-AIR(L)	UG
73	MASSURF	MASS IN SURF	%
74	MASGRW	MASS IN GRW	%
75	MASVOLA	MASS VOLATILIZE	%
76	MASSINK	MASS IN SINKS	%
77	MASSOIL	MASS ON SOIL	%
78	MASCECIM	MASS IMMOBILIZE	%
79	MASDEGRD	MASS DEGRADED	%
80	MASHYMOI	MASS HYDRO.-MOI	%
81	MASHYSOI	MASS HYDRO.-SOI	%
82	MASHYCEC	MASS HYDRO.-CEC	%
83	MASCCMPL	MASS COMPLEXED	%
84	MASTRANS	MASS TRANSFORME	%
85	MASMOI	MASS IN MOIST.	%
86	MASAIR	MASS IN AIR	%

U: UPPER SOIL LAYER

M: MIDDLE SOIL LAYER

L: LOWER SOIL LAYER

YR: YEARLY

MO: MONTHLY

TABLE 3. EXAMPLE OF SESOILFM PRODUCT(TABULAR DISPLAY)

#	MONTH	MINDEX	CONWMOU	MASWMOU
1	1	1	0.37293001E-02	86906.555
2	2	2	0.74580982E-02	173801.42
3	3	3	0.11186397E-01	260684.66
4	4	4	0.14914199E-01	347556.31
5	5	5	0.18641606E-01	434418.75
6	6	6	0.22368507E-01	521269.41
7	7	7	0.26095007E-01	608110.75
8	8	8	0.29821001E-01	694940.19
9	9	9	0.33546392E-01	781755.69
10	10	10	0.37271384E-01	868561.88
11	11	11	0.40995900E-01	955356.94
12	12	12	0.44719987E-01	1042142.0
13	13	1	0.48443485E-01	1128913.4
14	14	2	0.52166484E-01	1215673.1
15	15	3	0.55889081E-01	1302423.4
16	16	4	0.59611194E-01	1389162.5
17	17	5	0.63332774E-01	1475889.1
18	18	6	0.67053966E-01	1562606.8
19	19	7	0.70774674E-01	1649313.1
20	20	8	0.74494869E-01	1736007.4
21	21	9	0.78214593E-01	1822690.9
22	22	10	0.81933878E-01	1909364.1
23	23	11	0.85652687E-01	1996026.1
24	24	12	0.89371011E-01	2082676.9
25	25	1	0.93088754E-01	2169314.0
26	26	2	0.96806012E-01	2255940.0
27	27	3	0.10052200	2342536.5
28	28	4	0.10423800	2429133.0
29	29	5	0.10795202	2515683.5
30	30	6	0.11166400	2602186.5
31	31	7	0.11537600	2688689.8
32	32	8	0.11908799	2775193.3
33	33	9	0.12280001	2861697.0
34	34	10	0.12651201	2948200.3
35	35	11	0.13022399	3034703.3
36	36	12	0.13393600	3121207.0

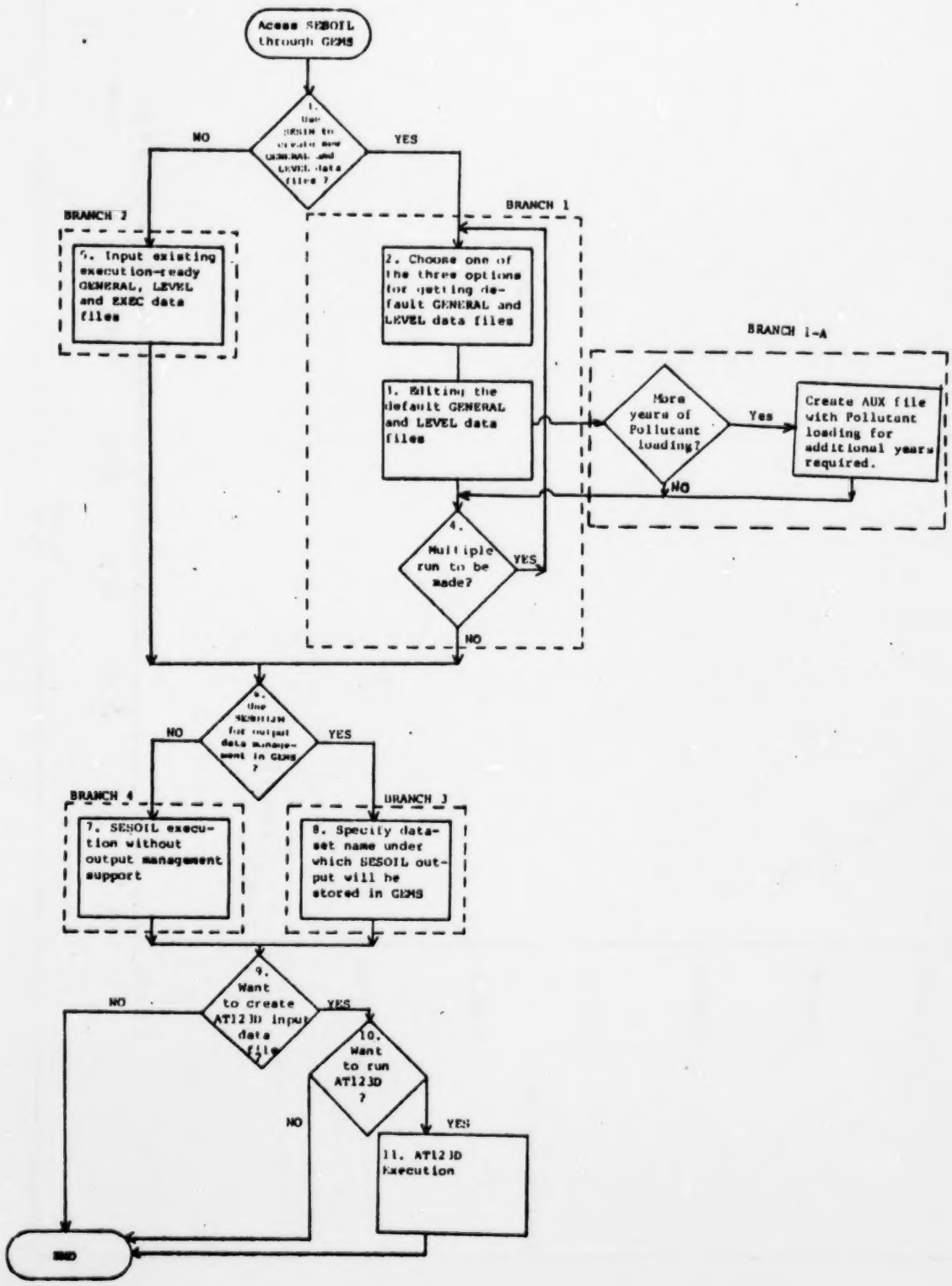

FIGURE 1. FLOWCHART FOR SESOIL EXECUTION WITH DATA MANAGEMENT SYSTEM SUPPORT

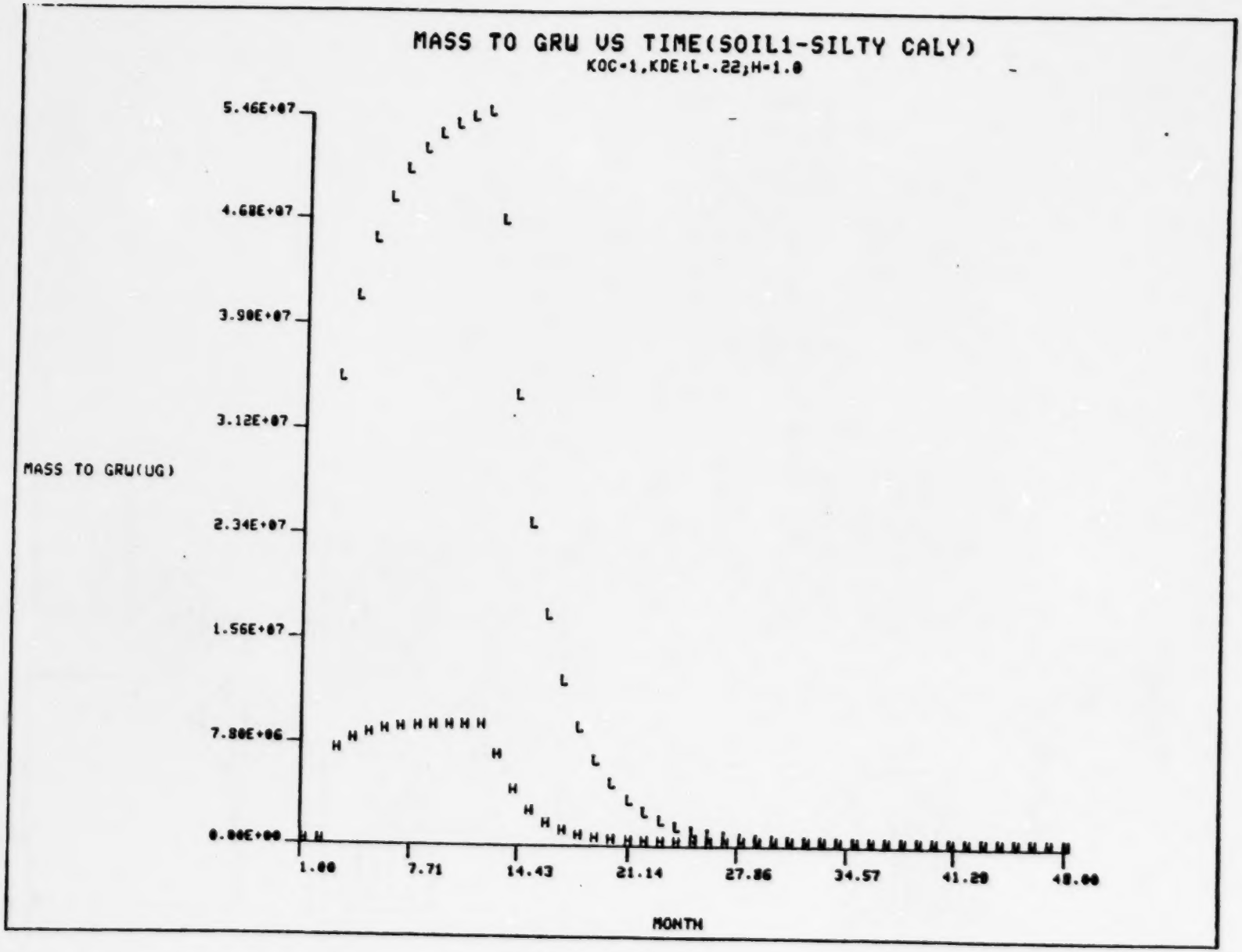

FIGURE 2. EXAMPLE OF SESOILF RODUCT(SCATTER DIAGRAM)

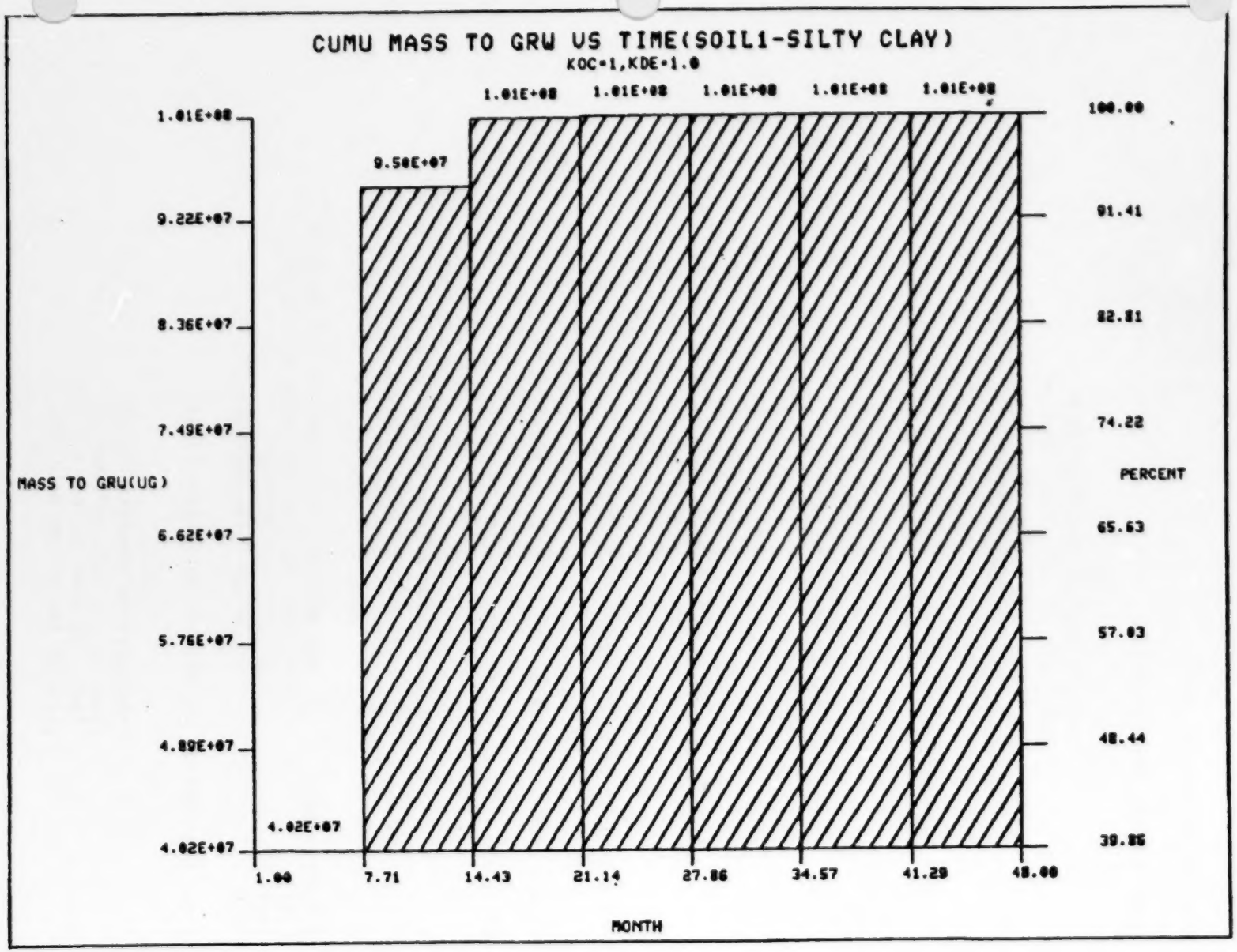

FIGURE 3. EXAMPLE OF SESOILFM PRODUCT(CUMULATIVE BARCHART)

APPENDIX 1: SESOIL SAMPLE RUN FOR 1 YEAR USING BOTH SESIN AND SESOILFM

```
Enter an operation: [m]

Enter a model name: [sesoil]

                              NOTE
                    ******************************
                    These are the two steps required
                    to access SESOIL through GEMS.
                    [ ] encloses your response.


Are you creating SESOIL input files: [yes]

                              NOTE
                    ******************************
                    This is the decision to enter
                    either BRANCH 1 or BRANCH 2
                    (see figure 1).


                                   SESIN
                          INTERACTIVE SESOIL INPUT
                                 GSC VER1.1
                                  5-DEC-84

For a list of commands type : HELP COMMANDS


Do you want to use data from the cities database? [yes]

Enter the name of the desired data site: [help]

                              NOTE
                    ******************************
                    'help' was used to get
                    assistance from the system.


A PLACE NAME            THE NAME OF A DATA SITE IN THE DATABASE
LIST                    TO LIST ALL THE AVAILABLE DATA SITES
EXIT                    TO EXIT THE PROGRAM
HELP                    TO OBTAIN THESE MESSAGES

Enter the name of the desired data site: [list]

                              NOTE
                    ******************************
                    Based on the help information,
                    'list' was used to show all the
                    sites in the cities database.
```

```
Enter the state abbreviation or ALL for entire list [all]

                          NOTE
                 ******************************
                 A list containing all sites in
                 all states was requested.

DATA AVAILABLE FOR:

MOBILE AL                JUNEAU AK                PHOENIX AZ
LITTLE ROCK AR           LOS ANGELES CA           SACRAMENTO CA
SAN FRANCISCO CA         DENVER CO                HARTFORD CT
WILMINGTON DE            WASHINGTON DC            JACKSONVILLE FL
MIAMI FL                 ATLANTA GA               HONOLULU HI
BOISE ID                 CHICAGO IL               PEORIA IL
INDIANAPOLIS IN          DES MOINES IA            WICHITA KS
LOUISVILLE KY            NEW ORLEANS LA           PORTLAND ME
BALTIMORE MD             BOSTON MA                DETROIT MI
SAULT STE MARIE MI       DULUTH MN                MINNEAPOLIS/ST PAUL MN
JACKSON MS               KANSAS CITY MO           ST LOUIS MO
GREAT FALLS MT           OMAHA NB                 RENO NV
CONCORD NH               ATLANTIC CITY NJ         ALBUQUERQUE NM
ALBANY NY                BUFFALO NY               NEW YORK NY
CHARLOTTE NC             RALEIGH NC               BISMARCK ND
CINCINNATI OH            CLEVELAND OH             COLUMBUS OH
OKLAHOMA CITY OK         PORTLAND OR              PHILADELPHIA PA
PITTSBURGH PA            PROVIDENCE RI            COLUMBIA SC
SIOUX FALLS SD           MEMPHIS TN               NASHVILLE TN
DALLAS/FORT WORTH TX     EL PASO TX               HOUSTON TX
SALT LAKE CITY UT        BURLINGTON VT            NORFOLK VA
RICHMOND VA              SEATTLE/TACOMA WA        SPOKANE WA
CHARLESTON WV            MILWAUKEE WI             CHEYENNE WY
SAN JUAN PR

Enter the name of the desired data site: [boston]

CURRENT SITE: BOSTON MA

Select run option: [help]

BACK        USE TO RETURN TO THE LIST OF SITES
BUILD       USE TO BUILD SESOIL/TOXSCREEN INPUT DATA FILES
REVIEW      USE TO REVIEW DATA FOR THE SELECTED SITE
EXIT        USE TO EXIT THE PROGRAM
```

```
CURRENT SITE: BOSTON MA

Select run option: [build]

                              NOTE
                  ******************************
                  Request was made to build up the
                  SESOIL input data files from the
                  70-city database for the Boston
                  site.


Enter soil data option: [help]

DEFAULT    THE PROGRAM WILL SELECT AN APPROPRIATE SOIL
SPECIFIC   USER SELECTS A SOIL FROM SITE SPECIFIC SOILS
GENERIC    USER SELECTS A SOIL FROM A LIST OF GENERIC SOILS
BACK       TO RETURN TO THE PREVIOUS PROMPT
HELP       TO OBTAIN THESE HELP MESSAGES

Enter soil data option: [default]

                              NOTE
                  ******************************
                  Request was made to let the
                  system automatically select an
                  appropriate soil which is one of
                  the needed SESOIL input information.


Do you wish to build a SESOIL data set for another location? [no]

                              NOTE
                  ******************************
                  To simplify the illustration,
                  only one site (Boston) is
                  selected here.


Enter your name for the general data file: [gen]

Enter your name for the level data file: [lev]

                              NOTE
                  ******************************
                  You can name the GENERAL and
                  LEVEL data files which contain
                  the data accessed from the
                  cities database.


** Database access completed **
```

APP.1:SESOIL SAMPLE RUN FOR 1 YEAR USING BOTH SESIN AND SESOILFM(CONT'D)

```
Current GENERAL data file is : GEN
To use an alternate GENERAL data file,
enter the file name (<CR> for none)? [<CR>]

                              NOTE
                  ******************************
                  An option to let you call in
                  another GENERAL file to be used
                  instead of the newly created
                  file:GEN.DAT. <CR> indicates that
                  you want to bypass this option.


***** DETERMINATION OF SESOIL POLLUTANT APPLICATION LEVEL  *****

City DATABASE access

Selected SESOIL application level is :  3

                              NOTE
                  ******************************
                  Remember that the 70-city data-
                  base can be used to build up
                  files for LEVEL 3 study only.
                  For other Levels, select the
                  remaining two options (see Sec.III).


*****  AVAILABLE CLIMATIC REGIONS  *****


  1.  BOSTON MA                CANTON SANDY LOAM FINE S

Only one site is available ** automatically selected


*****  CLIMATOLOGICAL PARAMETERS  *****


  1.  L [deg N]    latitude of area
  2.  NAME

Enter data item to be updated : [review]

                              NOTE
                  ******************************
                  You are strongly recommended to
                  review all retrieved data to
                  check their validity.


You may review data for the current year or for all years available.
```

```
Enter [C]urrent or [A]ll? [all]

                              NOTE
                 ******************************
                 Since there is only one year of
                 data presently available, the
                 entry of 'C' or 'A' makes no
                 difference.


   1 BOSTON MA                CANTON SANDY LOAM FINE S    1
L        42.36
TA       13.00  7.330.5556 -1.56 -0.89  3.39  9.22 14.78 20.00 22.94 21.83 18.06
NN        0.53   0.6   0.6   0.6  0.56  0.56  0.58  0.58  0.57  0.56  0.53  0.51
S         0.57  0.61  0.61  0.57  0.57  0.57  0.53  0.57   0.6  0.56  0.57  0.61
A         0.18  0.21  0.28  0.37  0.35  0.28  0.21  0.18  0.18  0.18  0.18  0.18
REP       0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
MPM       7.67 11.46 10.77  9.37  8.99 10.19  8.86  8.81  8.10  6.96  8.79  8.03
MTR     0.6667  1.040.7083 0.375  0.750.2917 0.3750.33330.20830.54170.0833   0.5
MN        7.00  4.00  9.00  6.00  8.00  5.00  9.00  7.00  8.00  9.00  5.00  7.00
MT        9.00 11.00 12.00 12.00 11.00 12.00 11.00 11.00 11.00  9.00 10.00  9.00

Press return to continue? [<CR>]

Enter data item to be updated : [done]

                              NOTE
                 ******************************
                 The use of 'done' signals that
                 the editing of the above data
                 has been completed and you are
                 advanced to the next prompt.


Current YEAR :  1

  1.  TA        [deg C]     temp of area
  2.  NN        [fraction]  fraction of area covered by clouds
  3.  S         [fraction]  relative humidity of area
  4.  A                     shortwave albedo of surface
  5.  REP       [cm/day]    dayly evapotranspiration or 0
  6.  MPM       [cm]        monthly precipitation
  7.  MTR       [days]      mean time of rain
  8.  MN        [#]         mean number of storm events
  9.  MT        [days]      mean length of rainy season

Enter data item to be updated : [1]

                              NOTE
                 ******************************
                 '1' means the values for TA are
                 to be updated.
```

```
The current values for TA        [deg C]    are

      1 Oct        2 Nov        3 Dec        4 Jan        5 Feb        6 Mar
      13.00         7.33   0.55559999        -1.56        -0.89         3.39

      7 Apr        8 May       9 June       10 July      11 Aug      12 Sept
       9.22        14.78        20.00        22.94        21.83        18.06

Enter the month(s) to alter? [10]

                              NOTE
                  ******************************
                  The value for July is to be
                  changed.

Enter the new value(s)? [24.0]

Current YEAR :  1

Enter data item to be updated : [done]

Would you like to enter data for another year? [no]

                              NOTE
                  ******************************
                  To simplify the illustration,
                  only one year of data is selected
                  here.  Multiple-year runs are
                  shown in Appendix 2.

*****  AVAILABLE SOILS  *****

  1.  CANTON SANDY LOAM FINE SANDY LOAM BOSTON

Only one soil is available ** automatically selected

*****  SOIL PARAMETERS  *****

  1.  RS     [g/cm2]   soil density
  2.  K1     [cm2]     soil intrinsic permeability
  3.  C                soil disconnectedness index
  4.  N                effective soil porosity
  5.  OC     [%oc]     organic content of soil
  6.  CC     [%cc]     clay content of soil
  7.  CEC    [me/100g] soil cation exchange capacity
  8.  K1U    [cm2]     intrinsic permeabilities of upper soil layer
```

```
  9.  K1M    [cm2]     intrinsic permeabilities of middle soil layer
 10.  K1L    [cm2]     intrinsic permeabilities of lower soil layer
 11.  RDUST  [ug/m3]   dust loading factor for TOXSCREEN only
 12.  NAME

Enter data item to be updated : [review]

                              NOTE
                 ******************************
                 Review is made here again to
                 to check the data.


   1 CANTON SANDY LOAM FINE SANDY LOAM BOSTON
       -  RS,K1,C,N,OC,CC                1.35   0.00   6.00   0.26   0.00   0.00
       -  CDC,K1U,K1M,K1L,RDUST          0.00.288E-7.288E-7.936E-7   0.00

Press return to continue? [<CR>]

Enter data item to be updated : [5]

The current value for OC     is :    0.00 [%oc]
Enter the new value, or hit <CR> to leave the same : [0.20]

                              NOTE
                 ******************************
                 The value of OC is changed from
                 0.00 to 0.20.


Enter data item to be updated : [done]

*****  AVAILABLE CHEMICALS  *****


  1.  TEST CHEMICAL

Only one chemical is available ** automatically selected

*****  CHEMICAL PARAMETERS  *****


  1.  SL     [ug/mL]             compound solubility in water
  2.  KOC    [(ug/g oc)/(ug/mL)  adsorption coeff in organic carbon
  3.  DA     [cm2/sec]           diffusion coefficient in air
  4.  KDE    [day-1]             biodegradation rate of compound
  5.  H      [m3*atm/degK*mol]   Henrys Law constant
  6.  K      [(ug/g)/(ug/mL)]    averaged adsorption coeff for compound on soi
  7.  MWT    [g/mol]             molecular weight
  8.  VAL                        valence
  9.  KNH    [day-1]             neutral hydrolysis constant
 10.  KBH    [L/mol*day]         base hydrolysis constant
 11.  KAH    [L/mol*day]         acid hydrolysis constant
```

```
 12.  SK                          stability constant compound-ligand complex
 13.  B       [#]                 moles of ligand per mole of bound compound
 14.  MWTLIG [g/mol]              molecular weight of ligand
 15.  NAME

Enter data item to be updated : [review]


   1 TEST CHEMICAL
     SL,KOC,DA,KDE,HENRY,K            730.00 157.00 0.0825  0.002 0.0031   0.00
     MWT,VAL,KNH,KBH,KAH              133.40   0.00   0.00   0.00   0.00
     SK,B,MWTLIG                        0.00   0.00   0.00

Press return to continue? [<CR>]

Enter data item to be updated : [all]

                          NOTE
                 ******************************
                 After review, changes to all of
                 the above data are requested.
                 The changes are carried out item
                 by item, as shown below.


                          NOTE
                 ******************************
                 Normally you would want to
                 replace the TEST CHEMICAL
                 parameters with your own
                 chemical data.


The current name is : TEST CHEMICAL
Enter the new name : [pcb-c12h9cl]

The current value for SL     is :  730.00 [ug/mL]
Enter the new value, or hit <CR> to leave the same : [1.17]

The current value for KOC    is :  157.00 [(ug/g oc)/(ug/mL)
Enter the new value, or hit <CR> to leave the same : [11500.0]

The current value for DA     is :  0.0825 [cm2/sec]
Enter the new value, or hit <CR> to leave the same : [0.06]

The current value for KDE    is :   0.002 [day-1]
Enter the new value, or hit <CR> to leave the same : [0.0346]

The current value for H      is :  0.0031 [m3*atm/degK*mol]
Enter the new value, or hit <CR> to leave the same : [0.0059]

The current value for K      is :    0.00 [(ug/g)/(ug/mL)]
Enter the new value, or hit <CR> to leave the same : [<CR>]
```

```
The current value for MWT    is :  133.40 [g/mol]
Enter the new value, or hit <CR> to leave the same : [<CR>]

The current value for VAL    is :    0.00
Enter the new value, or hit <CR> to leave the same : [<CR>]

The current value for KNH    is :    0.00 [day-1]
Enter the new value, or hit <CR> to leave the same : [<CR>]

The current value for KBH    is :    0.00 [L/mol*day]
Enter the new value, or hit <CR> to leave the same : [<CR>]

The current value for KAH    is :    0.00 [L/mol*day]
Enter the new value, or hit <CR> to leave the same : [<CR>]

The current value for SK     is :    0.00
Enter the new value, or hit <CR> to leave the same : [<CR>]

The current value for B      is :    0.00 [#]
Enter the new value, or hit <CR> to leave the same : [<CR>]

The current value for MWTLIG is :    0.00 [g/mol]
Enter the new value, or hit <CR> to leave the same : [<CR>]

Enter data item to be updated : [done]

Current application level data file is LEV
To use an alternate level data file,
enter the file name (<CR> for none)? [<CR>]

                              NOTE
                  ******************************
                  Editing of the GENERAL data file
                  has  been completed.  You are
                  now entering editing for the
                  LEVEL data file.


                              NOTE
                  ******************************
                  An option to let you call in
                  another LEVEL file to be used
                  instead of the newly created
                  file:LEV.DAT. <CR> indicates that
                  you want to bypass this option.


*****  AVAILABLE APPLICATION STUDY REGIONS  *****


   1.  BOSTON MA                CANTON SANDY LOAM FINE S
```

```
Only one site is available ** automatically selected

*****  MODIFICATION OF ANNUAL APPLICATION PARAMETERS  *****

  1.  AR     [cm2]    surface area
  2.  Z      [m]      depth to groundwater table
  3.  DU     [cm]     depth of upper unsaturated soil zone
  4.  DM     [cm]     depth of middle unsaturated soil zone
  5.  FRN             Freundlich equation exponent
  6.  PH              pH of upper unsaturated soil zone
  7.  A2PH            pH of middle unsaturated soil zone
  8.  APH             ratio: pH lower/upper unsaturated soil zone
  9.  A2KDE           ratio: biodeg rate lower/middle soil zone
 10.  AKDE            ratio: biodeg rate lower/upper soil zone
 11.  A2OC            ratio: organic carbon lower/middle
 12.  AOC             ratio: organic carbon lower/middle
 13.  A2CC            ratio: clay content lower/middle
 14.  ACC             ratio: clay content lower/upper
 15.  A2CEC           ratio: lower/middle soil zone cation exchange capacity
 16.  ACEC            ratio: lower/upper soil zone cation exchange capacity
 17.  NAME

Enter data item to be updated : [review]


You may review data for the current year or for all years available.
Enter [C]urrent or [A]ll? [all]


   1 BOSTON MA                CANTON SANDY LOAM FINE S    1
      - AR,Z,DU,DM,FRN                  10000.   2.74  15.24  68.58   1.00
      - PH,A2PH,APH                       4.80   1.00   1.00
      - A2KDE,AKDE,A2OC,AOC,A2CC,ACC      1.00   1.00   1.00   1.00   1.00   1.00
      - A2CEC,ACEC                        1.00   1.00
CUM      0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
CMM      0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
CLM      0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
POLINU   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
POLINM   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
POLINL   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
ISRM     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
ASL      0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
TRANSU   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
TRANSM   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
TRANSL   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
SINKU    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
SINKM    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
SINKL    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
LIGCU    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
LIGCM    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
```

```
LIGCL    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00

Press return to continue? [<CR>]

Enter data item to be updated : [done]

*****  MODIFICATION OF MONTHLY APPLICATION PARAMETERS  *****


Current YEAR :  1

  1.  CUM    [ug/mL]  conc pollutant in soil moisture upper zone
  2.  CMM    [ug/mL]  conc pollutant in soil moisture middle zone
  3.  CLM    [ug/mL]  conc pollutant in soil moisture lower zone
  4.  POLINU [ug/cm2] pollution load per unit area entering upper zone
  5.  POLINM [ug/cm2] pollution load per unit area entering middle zone
  6.  POLINL [ug/cm2] pollution load per unit area entering lower zone
  7.  ISRM   [ug/cm2] index for pollutant appearance in surface runoff
  8.  ASL             ratio: conc of pollutant/maximum solubility in H2O
  9.  TRANSU [ug/cm2] pollutant transformed in upper zone
 10.  TRANSM [ug/cm2] pollutant transformed in middle zone
 11.  TRANSL [ug/cm2] pollutant transformed in lower zone
 12.  SINKU  [ug/cm2] pollutant lost by processes not described (upper)
 13.  SINKM  [ug/cm2] pollutant lost by processes not described (middle)
 14.  SINKL  [ug/cm2] pollutant lost by processes not described (lower)
 15.  LIGU   [ug/cm2] ligand mass input to upper zone
 16.  LIGM   [ug/cm2] ligand mass input to middle zone
 17.  LIGL   [ug/cm2] ligand mass input to lower zone

Enter data item to be updated : [4]

The current values for POLINU [ug/cm2] are

      1 Oct       2 Nov       3 Dec       4 Jan       5 Feb       6 Mar
       0.00        0.00        0.00        0.00        0.00        0.00

      7 Apr       8 May       9 June     10 July     11 Aug     12 Sept
       0.00        0.00        0.00        0.00        0.00        0.00

Enter the month(s) to alter? [all]

                              NOTE
                 ******************************
                 'all' allows you to change all
                 months with one constant value.


Enter the new value(s)? [5000.0]

Current YEAR :  1

Enter data item to be updated : [back]
```

```
                              NOTE
                    ******************************
                    'back' allows you to go back to
                    the the previous parameter group
                    for re-editing.


*****  MODIFICATION OF ANNUAL APPLICATION PARAMETERS  *****


  1.  AR      [cm2]    surface area
  2.  Z       [m]      depth to groundwater table
  3.  DU      [cm]     depth of upper unsaturated soil zone
  4.  DM      [cm]     depth of middle unsaturated soil zone
  5.  FRN              Freundlich equation exponent
  6.  PH               pH of upper unsaturated soil zone
  7.  A2PH             pH of middle unsaturated soil zone
  8.  APH              ratio: pH lower/upper unsaturated soil zone
  9.  A2KDE            ratio: biodeg rate lower/middle soil zone
 10.  AKDE             ratio: biodeg rate lower/upper soil zone
 11.  A2OC             ratio: organic carbon lower/middle
 12.  AOC              ratio: organic carbon lower/~~middle~~upper
 13.  A2CC             ratio: clay content lower/middle
 14.  ACC              ratio: clay content lower/upper
 15.  A2CEC            ratio: lower/middle soil zone cation exchange capacity
 16.  ACEC             ratio: lower/upper soil zone cation exchange capacity
 17.  NAME

Enter data item to be updated : [1]

The current value for AR     is :  10000. [cm2]
Enter the new value, or hit <CR> to leave the same : [1000.]

Enter data item to be updated : [brief]

                              NOTE
                    ******************************
                    'brief' suppresses the displaying
                    of the menu parameter descrip-
                    tions.  This will save editing
                    time for experienced users.


Enter data item to be updated : [done]

*****  MODIFICATION OF MONTHLY APPLICATION PARAMETERS  *****


Current YEAR :  1

  1.  CUM
  2.  CMM
  3.  CLM
```

```
 4.  POLINU
 5.  POLINM
 6.  POLINL
 7.  ISRM
 8.  ASL
 9.  TRANSU
10.  TRANSM
11.  TRANSL
12.  SINKU
13.  SINKM
14.  SINKL
15.  LIGU
16.  LIGM
17.  LIGL

Enter data item to be updated : [done]

                    NOTE
            ******************************
            Since this data group has already
            been edited, no additional
            changes are made. (Notice that
            the parameter descriptions are
            suppressed.)


Do you wish to enter data for additional years? [no]

                    NOTE
            ******************************
            A sample run for multiple years
            of data is given in Appendix 2.


Would you like to change any exec file parameters? [no]

                    NOTE
            ******************************
            Unless you are experienced in
            the use of the EXEC file para-
            meters, changes by you are not
            recommended, except for making
            multiple-year runs as shown in
            Appendix 2.

Would you like to enter data for another run? [no]

                    NOTE
            ******************************
            You are encouraged to try this
            multiple run option.
```

```
Current GENERAL new input default FILENAME is : GENERAL.DAT
Enter your new input FILENAME? [newgen]

                    NOTE
              ******************************
              You can assign a specific name
              to the just edited SESOIL-ready
              GENERAL file.  Here the name
              NEWGEN.DAT was assigned.  A <CR>
              would have assigned the default
              name: GENERAL.DAT.


Current Level 3 new input default filename is : LEVEL3.DAT
Enter the name for your new input file? [newlev]

                    NOTE
              ******************************
              You can assign a specific name
              to the just edited SESOIL-ready
              LEVEL file.  Here, the name
              NEWLEV.DAT was assigned.  A <CR>
              would have assigned the default
              name LEVEL3.DAT.


Do you want to run SESOIL: [yes]

                    NOTE
              ******************************
              You have the option of running
              SESOIL now(by responding 'yes')
              or saving the newly edited data-
              sets to be run at a later time
              (a 'no' response).

 Enter BATCH or INTERACTIVE : [i]

                    NOTE
              ******************************
              You have the option to submit
              a batch(b) or interactive(i) job.


 Enter Y to output sesoil results to GEMS > [y]

                    NOTE
              ******************************
              This is to indicate if the out-
              put data management(SESOILFM)
              support is requested or not.
```

```
Enter GEMS output dataset name > [pcb]

                    NOTE
              ******************************
              If SESOILFM support was requested
              you need to give a name(1 to 12
              characters) under which the output
              dataset is to be stored in GEMS.

Enter tag field > [sesoil run for pcb at boston]

                    NOTE
              ******************************
              This is to give more descriptive
              dataset identification.  Press
              <CR> to bypass.

 DSNAME=TESTPCB1
  FMCLOS: IOPT=          1
FORTRAN STOP

                    NOTE
              ******************************
              At this point, SESOIL has been
              successfully executed using the
              two input files: NEWGEN.DAT and
              NEWLEV.DAT.   The output file is
              named SESOUT.DAT.

                    NOTE
              ******************************
              At this point, SESOILFM has
              stored selected SESOIL output
              parameters into GEMS under the
              name: PCB.  The link between
              SESOIL and AT123D starts below.

ENTER Y TO SEE SESOIL OUTPUT USABLE FOR AT123D > [y]

                    NOTE
              ******************************
              'y' will allow you to review all
              the AT123D-related SESOIL output
              parameters prior to building up
              an AT123D input file.  Those
              assumptions which require special
              consideration are displayed in
              brackets.
```

```
THE FOLLOWING GIVES SELECTED SESOIL OUTPUTS AND
THEIR CORRESPONDING AT123D INPUT VALUES
(SEE USER'S GUIDE FOR ASSUMPTIONS MADE)


(1)SESOIL-AREA(AR):   1000.000      SQ.CM.
   AT123D-SOURCE SIZE: RL1=  0.0000000E+00  RL2=  0.3162278
             (METERS)  RB1= -0.1581139      RB2=  0.1581139
                       RH1=  0.0000000E+00  RH2=  0.0000000E+00
(2)SESOIL-EFFECTIVE POROSITY(N):  0.2600000
   AT123D-EFFECTIVE POROSITY(POR):  0.2600000
(3)SESOIL-INTR. PERM.(K1):  5.5440285E-08  SQ. CM.
   AT123D-HYD. COND.(HCOND):  0.1710666      M/HR
 **[NOTE: POROSITY AND HYDR. COND. IN
   GROUNDWATER LAYERS MAY DIFFER SIGNIFICANTLY
   FROM THOSE USED IN SESOIL LAYERS.]
(4)SESOIL-AD. COEF.(K):   23.00000      ML/G
   AT123D-DIS. COEF.(AKD):  2.3000002E-02  M**3/KG
 **[NOTE: K IS DETERMINED INDIRECTLY
   FROM KOC AND OC.]
 **[NOTE: ACTUAL VALUE OF AKD MAY BE LOWER
   DUE TO LOWER OC CONCENTRATION (<0.1%)
   IN GROUNDWATER LAYER OF AT123D.]
(5)SESOIL-HYDROL. RATE(KNH):  0.0000000E+00  1/DAY
   AT123D-DECAY RATE(RAMADA):  0.0000000E+00  1/HR
 **[NOTE: OTHER PROCESSES IN ADDITION TO
   NEUTRAL HYDROLYSIS MAY BE CONSIDERED FOR
   TOTAL DEGREDATION IN GROUNDWATER.]
(6)SESOIL-SOIL DENSITY(RS):   1.350000      G/CM**3
   AT123D-BULK DENSITY(RHOB):  1350.000      KG/M**3

(7)SESOIL-MASS INTO GRW(12 VALUES PER YEAR)(KG/HR):

  1   0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00  0.2329E-11  0.4197E-11
      0.4553E-11  0.5116E-11  0.5013E-11  0.4576E-11  0.9528E-11  0.1260E-10

ENTER Y TO CREATE AT123D INPUT FILE
USING THE SELECTED SESOIL OUTPUTS > [y]

                          NOTE
                ******************************
                'y' allows you to create an
                AT123D input file based on the
                above SESOIL simulation run
                outputs.
```

```
ENTER THE DATA FILE NAME(6 CHARACTERS) > [pcb001]

                          NOTE
                ******************************
                An AT123D input data file name
                has to be assigned here.
                (6 characters are required.)


THE USABLE SESOIL VALUES HAVE BEEN STORED
IN AN AT123D INPUT DATASET:  pcb001.DAT
NOTE: THIS DATASET IS ALSO FILLED WITH OTHER
DEFAULT VALUES WHICH ARE TO BE USED WITH CAUTION.
YOU MAY EDIT THOSE DEFAULT VALUES USING AT123DIN.


DO YOU WANT TO RUN AT123D ?: [no]

                          NOTE
                ******************************
                'yes' will allow you to run
                AT123D using AT123DIN and
                AT123DOUT.  See the AT123D
                User's Guide(GSC,1984).


ENTER AN OPERATION:

                          NOTE
                ******************************
                This is back to GEMS.
```

APPENDIX 2: SESOIL SAMPLE RUN FOR MULTIPLE YEARS USING SESIN

```
Enter an operation: [m]

Enter a model name: [sesoil]
Are you creating SESOIL input files: [yes]


                                    SESIN
                          INTERACTIVE SESOIL INPUT
                                 GSC VER1.1
                                  6-DEC-84

For a list of commands type : HELP COMMANDS


Do you want to use data from the cities database? [no]

Current GENERAL data file is : DBA0:[EEDDAL.DATA]GENERAL.DAT
To use an alternate GENERAL data file,
enter the file name (<CR> for none)? [newgen]

                              NOTE
                 ********************************
                 Here, the data file:NEWGEN.DAT
                 created in Appendix 1 is called
                 in instead of accessing the 70-
                 cities database. (A <CR> entry
                 to the last prompt would have
                 accessed the default GENERAL data
                 file shown in Appendix 4.


***** DETERMINATION OF SESOIL POLLUTANT APPLICATION LEVEL  *****

Are pollutant loadings available as monthly or annual data? [m]
Are there 2 or 3 unsaturated soil layers? [3]

                              NOTE
                 ********************************
                 The two above prompts determine
                 the LEVEL type file used.


Selected SESOIL application level is :  3

*****  AVAILABLE CLIMATIC REGIONS  *****


  1.  BOSTON MA                CANTON SANDY LOAM FINE S

Only one site is available ** automatically selected
```

```
*****  CLIMATOLOGICAL PARAMETERS  *****

  1.  L [deg N]    latitude of area
  2.  NAME

Enter data item to be updated : [review]


You may review data for the current year or for all years available.
Enter [C]urrent or [A]ll? [all]

   1 BOSTON MA                CANTON SANDY LOAM FINE S    1
L        42.36
TA       13.00  7.330.5556 -1.56 -0.89  3.39  9.22 14.78 20.00 24.00 21.83 18.06
NN        0.53   0.6   0.6   0.6  0.56  0.56  0.58  0.58  0.57  0.56  0.53  0.51
S         0.57  0.61  0.61  0.57  0.57  0.57  0.53  0.57   0.6  0.56  0.57  0.61
A         0.18  0.21  0.28  0.37  0.35  0.28  0.21  0.18  0.18  0.18  0.18  0.18
REP       0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
MPM       7.67 11.46 10.77  9.37  8.99 10.19  8.86  8.81  8.10  6.96  8.79  8.03
MTR     0.6667  1.040.7083 0.375  0.750.2917 0.3750.33330.20830.54170.0833   0.5
MN        7.00  4.00  9.00  6.00  8.00  5.00  9.00  7.00  8.00  9.00  5.00  7.00
MT        9.00 11.00 12.00 12.00 11.00 12.00 11.00 11.00 11.00  9.00 10.00  9.00


Press return to continue? [<CR>]

Enter data item to be updated : [brief]

                              NOTE
                 ********************************
                 'brief' is used for more efficient
                 editing.


Enter data item to be updated : [done]

Current YEAR :  1

  1.  TA
  2.  NN
  3.  S
  4.  A
  5.  REP
  6.  MPM
  7.  MTR
  8.  MN
  9.  MT

Enter data item to be updated : [done]
```

```
Would you like to enter data for another year? [yes]
The previous years data is available.  Do you wish to use it? [yes]

                          NOTE
                ********************************
                A second year of data for the
                GENERAL file is generated by
                repeating the first year of data.


Current YEAR :  2

  1.  TA
  2.  NN
  3.  S
  4.  A
  5.  REP
  6.  MPM
  7.  MTR
  8.  MN
  9.  MT

Enter data item to be updated : [done]

                          NOTE
                ********************************
                This second year of GENERAL data
                can be edited.  Here, no changes
                are made.


Would you like to enter data for another year? [no]

                          NOTE
                ********************************
                Additional years of data can be
                generated in the same way up to
                10 years.  Here, only one addi-
                tional year has been generated.


*****  AVAILABLE SOILS  *****

  1.  CANTON SANDY LOAM FINE SANDY LOAM BOSTON

Only one soil is available ** automatically selected


*****  SOIL PARAMETERS  *****
```

```
  1.  RS
  2.  K1
  3.  C
  4.  N
  5.  OC
  6.  CC
  7.  CEC
  8.  K1U
  9.  K1M
 10.  K1L
 11.  RDUST
 12.  NAME

Enter data item to be updated : [done]

*****  AVAILABLE CHEMICALS  *****


  1.  PCB-C12H9CL

Only one chemical is available ** automatically selected

*****  CHEMICAL PARAMETERS  *****


  1.  SL
  2.  KOC
  3.  DA
  4.  KDE
  5.  H
  6.  K
  7.  MWT
  8.  VAL
  9.  KNH
 10.  KBH
 11.  KAH
 12.  SK
 13.  B
 14.  MWTLIG
 15.  NAME

Enter data item to be updated : [review]


  1 PCB-C12H9CL
     SL,KOC,DA,KDE,HENRY,K              1.17 11500.   0.06 0.0346 0.0059   0.00
     MWT,VAL,KNH,KBH,KAH              133.40   0.00   0.00   0.00   0.00
     SK,B,MWTLIG                        0.00   0.00   0.00

Press return to continue? [<CR>]

Enter data item to be updated : [done]
```

```
                    NOTE
          ********************************
          No changes have been made to any
          of the GENERAL data paramters.


Current application level data file is DBA0:[EEDDAL.DATA]LEVEL3.DAT
To use an alternate level data file,
enter the file name (<CR> for none)? [newlev]

                    NOTE
          ********************************
          Here, the data file:NEWLEV.DAT
          created in the sample run in
          Appendix 1 is called in instead
          of accessing the 70-cities data-
          base.  (A <CR> entry would have
          accessed one of the default level
          data files shown in Appendix 4.)


*****  AVAILABLE APPLICATION STUDY REGIONS  *****


  1.  BOSTON MA                CANTON SANDY LOAM FINE S


Only one site is available ** automatically selected


*****  MODIFICATION OF ANNUAL APPLICATION PARAMETERS  *****


  1.  AR
  2.  Z
  3.  DU
  4.  DM
  5.  FRN
  6.  PH
  7.  A2PH
  8.  APH
  9.  A2KDE
 10.  AKDE
 11.  A2OC
 12.  AOC
 13.  A2CC
 14.  ACC
 15.  A2CEC
 16.  ACEC
 17.  NAME

Enter data item to be updated : [done]
```

```
***** MODIFICATION OF MONTHLY APPLICATION PARAMETERS *****

Current YEAR : 1

  1. CUM
  2. CMM
  3. CLM
  4. POLINU
  5. POLINM
  6. POLINL
  7. ISRM
  8. ASL
  9. TRANSU
 10. TRANSM
 11. TRANSL
 12. SINKU
 13. SINKM
 14. SINKL
 15. LIGU
 16. LIGM
 17. LIGL

Enter data item to be updated : [review]


You may review data for the current year or for all years available.
Enter [C]urrent or [A]ll? [all]


   1 BOSTON MA                CANTON SANDY LOAM FINE S    1
     - AR,Z,DU,DM,FRN                10000.   2.74  15.24  68.58   1.00
     - PH,A2PH,APH                     4.80   1.00   1.00
     - A2KDE,AKDE,A2OC,AOC,A2CC,ACC    1.00   1.00   1.00   1.00   1.00   1.00
     - A2CEC,ACEC                      1.00   1.00
CUM       0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
CMM       0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
CLM       0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
POLINU   5000. 5000. 5000. 5000. 5000. 5000. 5000. 5000. 5000. 5000. 5000. 5000.
POLINM    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
POLINL    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
ISRM      0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
ASL       0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
TRANSU    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
TRANSM    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
TRANSL    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
SINKU     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
SINKM     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
SINKL     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
LIGCU     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
LIGCM     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
LIGCL     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
```

```
Press return to continue? [<CR>]

Current YEAR :  1

Enter data item to be updated : [done]
Do you wish to enter data for additional years? [yes]
The previous years data is available.  Do you wish to use it? [yes]


                          NOTE
                ********************************
                A second year of data for the
                LEVEL data file is generated by
                repeating the first year of data.


*****  MODIFICATION OF MONTHLY APPLICATION PARAMETERS  *****


Current YEAR :  2

  1.  CUM
  2.  CMM
  3.  CLM
  4.  POLINU
  5.  POLINM
  6.  POLINL
  7.  ISRM
  8.  ASL
  9.  TRANSU
 10.  TRANSM
 11.  TRANSL
 12.  SINKU
 13.  SINKM
 14.  SINKL
 15.  LIGU
 16.  LIGM
 17.  LIGL

Enter data item to be updated : [nobrief]

                          NOTE
                ********************************
                'nobrief' turns off the 'brief'
                command and all parameter descri-
                ptions will be displayed.


Current YEAR :  2

Enter data item to be updated : [done]
```

```
                    NOTE
              ******************************
              No changes have been made to the
              generated second year of LEVEL
              data.


Do you wish to enter data for additional years? [no]


                    NOTE
              ******************************
              Note that the number of years of
              data in the GENERAL and LEVEL
              data files must be the same.


Would you like to change any exec file parameters? [yes]

                    NOTE
              ******************************
              A 'yes' response here displays
              the EXEC file menu for editing.


  1.  JRUN    Do Not Change!
  2.  LEVEL   level of operation
  3.  JRE     index of area of application (GENERAL file)
  4.  JSO     soil index
  5.  JCH     chemical index
  6.  JNUT    nutrient cycle (cannot change)
  7.  JAPPL   application area (LEVEL file)
  8.  JYRS    number of years to be simulated (must be 1 for annual)

Enter data item to be updated : [8]

The current value for JYRS  is :    2.00
Enter the new value, or hit <CR> to leave the same : [5]

                    NOTE
              ******************************
              Here, it is desired to increase
              the number of years to be simulated
              from 2 to 5.  Because only 2 years
              of data are available (as previously
              created), the auxiliary pollution
              load data file is created as follows.
              (This is the decision to enter
              Branch 1-A:See Fig. 1)
```

```
                    NOTE
              ********************************
              This method of generating addi-
              tional data is usually used for
              long periods of simulation.  Up
              to 100 years may be simulated.
              Note that only the pollution
              load parameters (POLINU,POLINM,
              and POLINL) are edited.  The
              remaining GENERAL and LEVEL data
              parameters are automatically
              generated based on repeated use
              of the last year of available data.


Enter data item to be updated : [done]

AUX LOADINGS FILE

You have 2 years of data.
you must enter 3 more years.


  1.  SAME       sets all elements to the same number
  2.  RECYCLE    recycles existing loading data for remaining yea
  3.  EDIT       normal SESIN data entry/editing procedures

                    NOTE
              ********************************
              Two options are available for
              generating the auxiliary loading
              data file.(Option no. 2 has not
              yet been implemented in the
              present version.)


Enter method of loading entry: [1]

                    NOTE
              ********************************
              The 'SAME' method of generating
              loading data repeats a 1-year
              loading scenario for all the
              additional years of data required.

Enter soil layer (1, 2, or 3)? [1]

                    NOTE
              ********************************
              Here, the loading is applied to
              the upper soil layer (layer 1),
              (POLINU).
```

```
Enter month(s) to alter? [all]

                              NOTE
                 ********************************
                 Here, all months in a year will
                 have the same loading value.


Enter loading? [2000.]


                              NOTE
                 ********************************
                 Here, a loading value of 2000 is
                 applied to all months of all of
                 the remaining years required
                 (years 3,4 and 5).

You have 5 years of data.
you must enter 0 more years.


  1.  SAME      sets all elements to the same number
  2.  RECYCLE   recycles existing loading data for remaining yea
  3.  EDIT      normal SESIN data entry/editing procedures

Enter method of loading entry: [3]

                              NOTE
                 ********************************
                 The 'EDIT' method of loading data
                 entry allows you to edit the
                 loading quantities for individual
                 years.


*****  ENTRY OF AUXILARY LOADING PARAMETERS  *****


Current YEAR :  3

  1.  POLINU    Upper level loadings
  2.  POLINM    middle level loadings
  3.  POLINL    lower level loadings

                              NOTE
                 ********************************
                 Editing begins with the first
                 year in the AUX loading file
                 (year 3).
```

```
Enter data item to be updated : [1]

                              NOTE
                 ********************************
                 Here, the source load is applied
                 to the upper soil layer (POLINU).


The current values for POLINU    are

     1 Oct       2 Nov       3 Dec       4 Jan       5 Feb       6 Mar
   2000.00     2000.00     2000.00     2000.00     2000.00     2000.00

     7 Apr       8 May       9 June      10 July     11 Aug      12 Sept
   2000.00     2000.00     2000.00     2000.00     2000.00     2000.00

Enter the month(s) to alter? [done]

                              NOTE
                 ********************************
                 No months are to be altered.


Current YEAR :  3

Enter data item to be updated : [next]

                              NOTE
                 ********************************
                 'next' advances the editing to
                 the next year.


Current YEAR :  4

Enter data item to be updated : [1]

The current values for POLINU    are

     1 Oct       2 Nov       3 Dec       4 Jan       5 Feb       6 Mar
   2000.00     2000.00     2000.00     2000.00     2000.00     2000.00

     7 Apr       8 May       9 June      10 July     11 Aug      12 Sept
   2000.00     2000.00     2000.00     2000.00     2000.00     2000.00

Enter the month(s) to alter? [all]
Enter the new value(s)? [1000.]

                              NOTE
                 ********************************
                 Here, the values of POLINU for
                 all months of year 4 are changed
```

```
                    from 2000 to 1000.

Current YEAR :  4

Enter data item to be updated : [done]

                              NOTE
                    ********************************
                    No more changes are to be made
                    for year 4.

You have 5 years of data.
you must enter 0 more years.

  1.  SAME       sets all elements to the same number
  2.  RECYCLE    recycles existing loading data for remaining years
  3.  EDIT       normal SESIN data entry/editing procedures

Enter method of loading entry: [done]

                              NOTE
                    ********************************
                    Here, 'done' indicates that you
                    have completed all editing of
                    the auxiliary loading data file
                    AUX.

Would you like to enter data for another run? [no]

Current GENERAL new input default FILENAME is : GENERAL.DAT
Enter your new input FILENAME? [newgen2]
Current Level 3 new input default filename is : LEVEL3.DAT
Enter the name for your new input file? [newlev2]
Enter filename for aux loadings file: [aux5]

                              NOTE
                    ********************************
                    You must also specify a filename
                    for the auxiliary loading file.

Do you want to run SESOIL: [yes]

Enter BATCH or INTERACTIVE : [b]
 Enter Y to output sesoil results to GEMS > [<CR>]
 Job 9410 entered on queue SYS BATCH
```

```
                    NOTE
*******************************
Here, the run is submitted as a
batch job.


Enter an operation:

                    NOTE
*******************************
This is back to GEMS.
```

APPENDIX 3: SESOIL SAMPLE RUN BYPASSING BOTH SESIN AND SESOILFM

```
Enter an operation: [m]

Enter a model name: [sesoil]
Are you creating SESOIL input files: [no]

                              NOTE
                  ********************************
                  This is the decision to enter
                  either Branch 1 or Branch 2(See
                  Fig. 1).  This example shows
                  that Branch 2(i.e. no SESIN
                  support) has been requested.


Enter DUMMY below if the file(s) is not needed
by your run

Enter filename of GENERAL data file:  [newgen]
Enter filename of LEVEL0 data file:  [dummy]
Enter filename of LEVEL1 data file:  [dummy]
Enter filename of LEVEL2 data file:  [dummy]
Enter filename of LEVEL3 data file:  [newlev]
Enter filename of EXEC data file:  [exec]
Enter filename of AUXILIARY data file(needed if JYRS>run years):  [dummy]

                              NOTE
                  ********************************
                  Since SESIN support is not
                  requested, the above are to input
                  your own GENERAL, LEVEL, and EXEC
                  data files.  Only one LEVEL file
                  is needed for each run.  The
                  AUXILIARY data file is needed if
                  the value of JYRS in the EXEC
                  file is greater than the number
                  of years of data available in
                  the GENERAL and LEVEL files
                  (see Appendix 2).

 Enter BATCH or INTERACTIVE : [i]

 Enter Y to output SESOIL results to GEMS > [<CR>]

                              NOTE
                  ********************************
                  <CR> indicates that SESOILFM
                  support is not requested.
 DSNAME=-1
  FMCLOS: IOPT=          0
FORTRAN STOP
```

```
                    NOTE
              ********************************
              Indication of SESOIL FORTRAN
              execution completion.


ENTER Y TO SEE SESOIL OUTPUT USABLE FOR AT123D > [<CR>]

                    NOTE
              ********************************
              Review of SESOIL output usable
              for AT123D is not requested.


ENTER Y TO CREATE AT123D INPUT FILE
USING THE SELECTED SESOIL OUTPUTS > [<CR>]

                    NOTE
              ********************************
              Build up of AT123D input file
              via SESOIL output is not requested.


DO YOU WANT TO RUN AT123D ?: [no]

The output file for this modeling run is named SESOUT.DAT
Enter rename, print, type or <CR> to exit: [<CR>]

                    NOTE
              ********************************
              Here, the decision is to exit.


Enter a model name:

                    NOTE
              ********************************
              This is back to GEMS.


*******************************NOTE*******************************
******************************************************************
In summary, this example shows a SESOIL run without the support
of SESIN and SESOILFM.  The user needs to input his own data
files.  The complete SESOIL output is stored in a file named
SESOUT.DAT.
******************************************************************
```

APPENDIX 4: SESIN-PROVIDED DEFAULT DATA FILES: GENERAL, LEVEL0, LEVEL1, LEVEL2, AND LEVEL3

GENERAL DATA FILE

```
1     REGIONAL DESCRIPTIONS; CLIMATIC-STORM DATA: (TEST DATA ONLY)
   1 CLINTON,    MA. (SUB-HUMID):
       - L,TA,NN,S,A,REP                 42.50   8.40   0.35   0.70   0.30   0.00
       - MPA,MTR,MN,HT                   94.10   0.32 109.00 365.00
       - MP(M) (OCTOBER-MARCH)           10.36   8.96  12.52  11.75   8.33   8.33
       - MP(M) (APRIL-SEPTEMBER)          8.38   7.82   6.60   5.08   6.04   8.46
   2 SITE B (MONTANA) (1940-1979)
       - L,TA,NN,S,A,REP                 45.00  10.05   0.30    .55   0.25   0.00
       - MPA,MTR,MN,MT                   36.74   0.24  103.0 365.00
       - MP(M)OCT-MAR                     2.00   1.63   2.59   4.11   5.44.  6.25
       - MP(M)APR-SEP                     2.33   2.36   3.40   2.84   1.96   1.83
   3 SITE A (KANSAS) (1940-1980)
       - L,TA,NN,S,A,REP                 39.00  14.30   0.30   60.0   0.10   0.00
       - MPA,MTR,MN,MT                   84.83   0.20  105.0 365.00
       - MP(M)OCT-MAR                     6.40   4.22   2.95   2.46   3.20   5.20
       - MP(M)APR-SEP                     7.82  11.10  12.17   9.97  10.24   9.12
   4 CLINTON,MASS.(40 YR AVERAGED DATA FOR TEST ONLY)   10
L       42.50 42.50 42.50 42.50 42.50 42.50 42.50 42.50 42.50 42.50 42.50 42.50
TA       8.40  8.40  8.40  8.40  8.40  8.40  8.40  8.40  8.40  8.40  8.40  8.40
NN        .32   .32   .32   .32   .32   .32   .32   .32   .32   .32   .32   .32
S         .70   .70   .70   .70   .70   .70   .70   .70   .70   .70   .70   .70
A        0.3   0.3   0.3   0.3   0.3   0.3   0.3   0.3   0.3   0.3   0.3   0.3
REP      0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
MPM      7.84  7.84  7.84  7.84  7.84  7.84  7.84  7.84  7.84  7.84  7.84  7.84
MTR       .32   .32   .32   .32   .32   .32   .32   .32   .32   .32   .32   .32
MN       9.08  9.08  9.08  9.08  9.08  9.08  9.08  9.08  9.08  9.08  9.08  9.08
MT      30.42 30.42 30.42 30.42 30.42 30.42 30.42 30.42 30.42 30.42 30.42 30.42

L-2     42.50 42.50 42.50 42.50 42.50 42.50 42.50 42.50 42.50 42.50 42.50 42.50
TA-2     8.40  8.40  8.40  8.40  8.40  8.40  8.40  8.40  8.40  8.40  8.40  8.40
NN-2      .32   .32   .32   .32   .32   .32   .32   .32   .32   .32   .32   .32
S-2       .70   .70   .70   .70   .70   .70   .70   .70   .70   .70   .70   .70
A-2      0.3   0.3   0.3   0.3   0.3   0.3   0.3   0.3   0.3   0.3   0.3   0.3
REP-2    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
MPM-2    7.84  7.84  7.84  7.84  7.84  7.84  7.84  7.84  7.84  7.84  7.84  7.84
MTR-2     .32   .32   .32   .32   .32   .32   .32   .32   .32   .32   .32   .32
MN-2     9.08  9.08  9.08  9.08  9.08  9.08  9.08  9.08  9.08  9.08  9.08  9.08
MT-2    30.42 30.42 30.42 30.42 30.42 30.42 30.42 30.42 30.42 30.42 30.42 30.42

L-3     42.50 42.50 42.50 42.50 42.50 42.50 42.50 42.50 42.50 42.50 42.50 42.50
TA-3     8.40  8.40  8.40  8.40  8.40  8.40  8.40  8.40  8.40  8.40  8.40  8.40
NN-3      .32   .32   .32   .32   .32   .32   .32   .32   .32   .32   .32   .32
S-3       .70   .70   .70   .70   .70   .70   .70   .70   .70   .70   .70   .70
A-3      0.3   0.3   0.3   0.3   0.3   0.3   0.3   0.3   0.3   0.3   0.3   0.3
REP-3    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
MPM-3    7.84  7.84  7.84  7.84  7.84  7.84  7.84  7.84  7.84  7.84  7.84  7.84
```

MTR-3	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32
MN-3	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08
MT-3	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42
L-4	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50
TA-4	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40
NN-4	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32
S-4	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70
A-4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
REP-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MPM-4	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
MTR-4	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32
MN-4	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08
MT-4	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42
L-5	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50
TA-5	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40
NN-5	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32
S-5	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70
A-5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
REP-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MPM-5	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
MTR-5	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32
MN-5	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08
MT-5	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42
L-6	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50
TA-6	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40
NN-6	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32
S-6	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70
A-6	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
REP-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MPM-6	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
MTR-6	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32
MN-6	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08
MT-6	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42
L-7	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50
TA-7	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40
NN-7	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32
S-7	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70
A-7	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
REP-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MPM-7	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
MTR-7	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32
MN-7	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08
MT-7	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42
L-8	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50
TA-8	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40
NN-8	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32
S-8	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70
A-8	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

REP-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MPM-8	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
MTR-8	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32
MN-8	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08
MT-8	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42
L-9	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50
TA-9	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40
NN-9	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32
S-9	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70
A-9	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
REP-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MPM-9	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
MTR-9	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32
MN-9	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08
MT-9	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42
L-10	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50
TA-10	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40
NN-10	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32
S-10	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70	.70
A-10	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
REP-10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MPM-10	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
MTR-10	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32	.32
MN-10	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08	9.08
MT-10	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42	30.42

```
2     SOIL CLASSIFICATION DATA: (TEST DATA ONLY)
    1 CLAY
        -  RS,K1,C,N,OC,CC                1.32 1.E-10  12.00   0.45   1.46
        -  CEC,K1U,K1M,K1L               15.00   0.00   0.00   0.00
    2 SILTY-LOAM-KANSAS
        - RS,K1,C,N,OC,CC                 1.32 7.E-09   6.00   0.35    2.9
        - CEC                            0.00
    3 SILTY-CLAY-MONTANA
        - RS,K1,C,N,OC,CC                 1.324.2E-10  10.00   0.35     .63
        - CEC                            0.00
    4 SILTY-LOAM-KANSAS (K1 ADJUSTED)
        -  RS,K1,C,N,OC,CC                1.32 1.E-13   6.00   0.35    2.9
        -  CEC                           0.00
    5 CLAY-LOAM GENERIC
        -RS,K1,C,N,OC,CC                  1.32 .28E-9  10.00   0.35    1.3 .20E-1
        -CEC                              .00
    6 SANDY-LOAM
        -  RS,K1,C,N,OC,CC                1.322.5E-10   4.00   0.25   0.10   0.00
        -  CEC                           0.00
    7 TEST SOIL
        -  RS,K1,C,N,OC,CC                1.32 .25E-9   4.00   0.25   0.10   5.00
        -  CEC,K1U,K1M,K1L               15.00 .22E-9 .33E-9 .44E-9
    8 SILTY-LOAM GENERIC
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      -RS,K1,C,N,OC,CC                    1.32 1.2E-9   6.00   0.35    2.9
      -CEC                                0.00
    9 SAND-GENERIC
      -RS,K1,C,N,OC,CC                    1.32 1.0E-7   3.50   0.25    .01
      -CEC                                0.00
3     CHEMISTRY DATA;   (TEST DATA ONLY)   Please review & modify before use!
    1 COPPER
      SL,KOC,DA,KDE,H,K                   0.00   0.00   0.00   0.00   0.00  10.00
      MWT,VAL,KNH,KBH,KAH                 0.00   0.00   0.00   0.00   0.00   0.00
      SK,B,MWTLIG                         0.00   0.00   0.00   0.00   0.00   0.00
    2 SODIUM
      SL,KOC,DA,KDE,H,K                   0.00   0.00   0.00   0.00   0.00    .10
      MWT,VAL,KNH,KBH,KAH                 0.00   0.00   0.00   0.00   0.00   0.00
      SK,B,MWTLIG                         0.00   0.00   0.00   0.00   0.00   0.00
    3 CHROMIUM
      SL,KOC,DA,KDE,H,K                   0.00   0.00   0.00   0.00   0.00 250.00
      MWT,VAL,KNH,KBH,KAH                 0.00   0.00   0.00   0.00   0.00   0.00
      SK,B,MWTLIG                         0.00   0.00   0.00   0.00   0.00   0.00
    4 NICKEL
      SL,KOC,DA,KDE,H,K                   0.00   0.00   0.00   0.00   0.00   2.50
      MWT,VAL,KNH,KBH,KAH                 0.00   0.00   0.00   0.00   0.00   0.00
      SK,B,MWTLIG                         0.00   0.00   0.00   0.00   0.00   0.00
    5 NAPTHALENE
      SL,KOC,DA,KDE,H,K                   0.0 1070.006.98E-6   0.00   0.00   0.00
      MWT,VAL,KNH,KBH,KAH                 0.00   0.00   0.00   0.00   0.00   0.00
      SK,B,MWTLIG                         0.00   0.00   0.00   0.00   0.00   0.00
    6 ANTHRACENE
      SL,KOC,DA,KDE,H,K                   0.00  1.6E45.89E-6   0.00   0.00    .00
      MWT,VAL,KNH,KBH,KAH                 0.00   0.00   0.00   0.00   0.00   0.00
      SK,B,MWTLIG                         0.00   0.00   0.00   0.00   0.00   0.00
    7 SODIUM-ADJUSTED KOC
      SL,KOC,DA,KDE,H,K                   0.00   0.00   0.00   0.00   0.00   1.00
      MWT,VAL,KNH,KBH,KAH                 0.00   0.00   0.00   0.00   0.00   0.00
      SK,B,MWTLIG                         0.00   0.00   0.00   0.00   0.00   0.00
    8 PERCHLOROETHLYENE(=TETRACHLOROETHLYENE)
      SL,KOC,KD,KDE,HENRY,K             150.00 468.00  .0746   0.00 .00204   0.00
      MWT,VAL,KNH,KBH,KAH,MWTLIG          0.00   0.00   0.00   0.00   0.00   0.00
      SK,B,MWTLIG                         0.00   0.00   0.00   0.00   0.00   0.00
    9 1,1,1-TRICHLOROETHANE
      SL,KOC,DA,KDE,HENRY,K             720.00 174.00  .0803   0.00 .00298   0.00
      MWT,VAL,KNH,KBH,KAH,MWTLIG          0.00   0.00   0.00   0.00   0.00   0.00
      SK,B,MWTLIG                         0.00   0.00   0.00   0.00   0.00   0.00
   10 METHLYCHLOROFORM
      SL,KOC,DA,KDE,HENRY,K             730.00 189.00  .0825   0.00 .00231   0.00
      MWT,VAL,KNH,KBH,KAH,MWTLIG          0.00   0.00   0.00   0.00   0.00   0.00
      SK,B,MWTLIG                         0.00   0.00   0.00   0.00   0.00   0.00
   11 METHLYENE CHLORIDE
      SL,KOC,DA,KDE,HENRY,K             13200.  11.00  .1033   0.003.68E-4   0.00
      MWT,VAL,KNH,KBH,KAH,MWTLIG          0.00   0.00   0.00   0.00   0.00   0.00
      SK,B,MWTLIG                         0.00   0.00   0.00   0.00   0.00   0.00
   12 CARBON TETRACHLORIDE
      SL,KOC,DA,KDE,HENRY,K             785.00 269.00  .0828   0.00 .00232   0.00
      MWT,VAL,KNH,KBH,KAH,MWTLIG        B 0.00   0.00   0.00   0.00   0.00   0.00
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      SK,B,MWTLIG                          0.00    0.00    0.00    0.00    0.00    0.00
   13 FREON 113
      SL,KOC,DA,KDE,HENRY,K              170.00  642.00   .0693    0.00    .391    0.00
      MWT,VAL,KNH,KBH,KAH,MWTLIG           0.00    0.00    0.00    0.00    0.00    0.00
      SK,B,MWTLIG                          0.00    0.00    0.00    0.00    0.00    0.00
   14 TRICHLOROETHYLENE(TCE)
      SL,KOC,DA,KDE,HENRY,K             1100.00  100.00   .0830    0.009.44E-3    0.00
      MWT,VAL,KNH,KBH,KAH,MWTLIG           0.00    0.00    0.00    0.00    0.00    0.00
      SK,B,MWTLIG                          0.00    0.00    0.00    0.00    0.00    0.00
   15 TEST CHEM
      SL,KOC,DA,KDE,HENRY,K             1100.00  360.00 8.3E-6    0.2 9.44E-3
      MWT,VAL,KNH,KBH,KAH                  5.00    2.00   .7E-5    8.00    9.00   10.00
      SK,B,MWTLIG                       100000.    2.00   10.00    0.00    0.00    0.00
9     END FILE
```

LEVEL0 DATA FILE

```
   1 CLINTON,    MA. (SUB-HUMID):  FLAG
      -  AR,Z,DU,PH,APH                   1.00  100.0   15.00    7.00    1.00
      -  AKDE,AOC,ACC,ISRA,ASL,ACEC        .50     .50    0.50    1.00    .001
      -  POLINU,POLINL,LIGU,LIGL         200.0  1000.0  1000.0  2000.0
      -  THA,INF,RGA,RSA                 25.7    60.70   26.2    33.9
   2 TEST LOCATION
      -  AR,Z,DU,PH,APH                   1.00  100.00   15.00    8.00    .875
      -  AKDE,AOC,ACC,ISRA,ASL,ACEC       1.10    1.20    1.30     .40    0.5    .001
      -  POLINU,POLINL,LIGC,ALIGC       200.00  1000.0   10.00   50.00
      -  THA,IA,RGA,RSA                  25.70   60.70   26.20   33.90
9     END FILE
```

LEVEL1 DATA FILE

```
   1 CLINTON,    MA. (SUB-HUMID):
      -  AR,Z,DU,PH,APH                   1.00  100.0   15.00    7.00    1.00
      -  AKDE,AOC,ACC,ISRA,ASL,ACEC        .50     .50    0.50    1.00    .001
      -  SPOLI,SPOLL,LIGU,LIGL           200.0  1000.0  1000.0  2000.0
   2 TEST LOCATION
      -  AR,Z,DU,PH,APH                  10.00  100.00   15.00    8.00    .875
      -  AKDE,AOC,ACC,ISRA,ASL,ACEC       1.10    1.20    1.30     .40    0.5    .001
      -  POLINU,POLINL,LIGC,LIGL        200.00  1000.0   10.00   50.00
9     END OF FILE
```

LEVEL2 DATA FILE

```
   1 KANSAS-COPPER  (OCT. '78-SEP '80)                    2
       -  AR,Z,DU,PH,APH                    1.00  50.0   15.00
       -  AKDE,AOC,ACC,FRN,ACEC             0.00   1.00   0.00   1.00   0.00
CUM       0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
CLM       0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
POLINU    0.00  0.00  0.00  0.00  0.00  0.00  3.24  0.00  0.00  0.00  0.00  0.0
POLINL    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
ISRM      0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
ASL       0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
TRANSU    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
TRANSL    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
SINKU     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
SINKL     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
LIGU      0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
LIGL      0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
CUM2      0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
CLM2      0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
POLINU2   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
POLINL2   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
ISRM2     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
ASL2      0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
TRANSU2   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
TRANSL2   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
SINKU2    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
SINKL2    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
LIGU2     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
LIGL2     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
   2 TEST RUN (CLINTON, MA. 40 YEARS)                     5
       -  AR,Z,DU,PH,APH                    1.00 100.00  15.00   8.00   .875
       -  AKDE,AOC,ACC,FRN,ACEC             1.10   1.20   1.30   1.40   .001
CUM       0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
CLM       0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
POLINU  200.0   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
POLINU 1000.0   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
ISRM      1.00  1.00  1.00  1.00  1.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
TRANSU    0.20  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
TRANSL    0.30  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
SINKU     0.40  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
SINKL     0.50  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
LIGU   1000.0   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
LIGL   2000.0   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
CUM2      0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
CLM2      0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
POLINU2   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
POLINL2   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
ISRM2     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
```

ASL2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSU2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSL2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKU2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKL2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGU2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGL2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CUM3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CLM3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINU3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINL3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ISRM3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ASL3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSU3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSL3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKU3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKL3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGU3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGL3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CUM4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CLM4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINU4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINL4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ISRM4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ASL4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSU4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSL4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKU4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKL4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGU4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGL4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CUM5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CLM5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINU5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINL5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ISRM5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ASL5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSU5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSL5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKU5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKL5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGU5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGL5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0

9 END FILE

LEVEL3 DATA FILE

```
  1 TEST RUN                                                    10
    -AR,Z,DU,DM,FRN                          1.00 100.00  15.00   0.01   1.40
    -PH,A2PH,APH                             8.00   1.00   .875
    -A2KDE,AKDE,A2OC,AOC,A2CC,ACC            1.10   1.10   1.20   1.20   1.30   1.30
    -A2CEC,ACEC                              1.30   1.30
CUM       0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
CMM       0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
CLM       0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
POLINU  200.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
POLINM    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
POLINL 1000.0   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
ISRM      1.00  1.00  1.00  1.00  1.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
ASL       .001  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
TRANSU    0.20  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
TRANSM    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
TRANSL    0.30  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
SINKU     0.40  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
SINKM     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
SINKL     0.50  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
LIGCU  1000.0   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
LIGCM     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
LIGCL  2000.0   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
CUM-2     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
CMM-2     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
CLM-2     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
POLINU2   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
POLINM2   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
POLINL2   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
ISRM-2    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
ASL-2     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
TRANSU    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
TRANSM    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
TRANSL    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
SINKU2    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
SINKM2    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
SINKL2    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
LIGCU2    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
LIGCM2    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
LIGCL2    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
CUM-3     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
CMM-3     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
CLM-3     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
POLINU3   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
POLINM3   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
POLINL3   0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
ISRM-3    0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
ASL-3     0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.0
```

TRANSU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKU3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKM3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKL3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCU3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCM3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCL3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CUM-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CMM-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CLM-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINU4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINM4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINL4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ISRM-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ASL-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKU4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKM4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKL4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCU4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCM4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCL4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CUM-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CMM-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CLM-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINU5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINM5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINL5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ISRM-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ASL-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKU5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKM5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKL5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCU5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCM5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCL5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CUM-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CMM-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CLM-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINU6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINM6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINL6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ISRM-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ASL-6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0

TRANSL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKU6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKM6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKL6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCU6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCM6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCL6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CUM-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CMM-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CLM-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINU7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINM7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINL7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ISRM-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ASL-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKU7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKM7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKL7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCU7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCM7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCL7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CUM-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CMM-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CLM-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINU8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINM8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINL8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ISRM-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ASL-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKU8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKM8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKL8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCU8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCM8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
LIGCL8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CUM-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CMM-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
CLM-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINU9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINM9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
POLINL9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ISRM-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
ASL-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
TRANSL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
SINKU9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0